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TRANSACTIONS

OF THE

Literary and Historical Society of Quebec.

SESSION OF 1870-71.

PAPER I.—OPENING ADDRESS—"REVIEW OF THE PAST YEAR: MOVING ACCIDENTS BY FLOOD AND FIELD."

BY DR. W. J. ANDERSON, PRESIDENT.

(Read before the Society, Nov. 16th, 1870.)

MERCANTILE LIBRARY PHILADA.

ABOUT two hundred years ago—in the beginning of January, 1666—those of our forefathers who inhabited the city of London, took breath between the shocks of two fearful calamities: one not quite past, though its fury had abated; the other to come.

The plague had appeared at the close of 1664, and, though no new visitor, smote in the course of the following year the people of England, and especially of her capital, with a violence unknown before. Defoe, in the "*History of the Plague Year*," shews death, with every accompaniment of pain and terror, stalking through the narrow streets of old London, and changing their busy hum into a silence broken only by the wailing of the mourners of fifty thousand dead; by the woful denunciations and mad prayers of fanatics, and by the madder yells of despairing profligates.

But about the period first-mentioned, the death-rate had sunk to nearly its ordinary amount; a case of plague occurred only here and there, and the richer citizens had returned to their dwellings. The remnant of the people

began to toil in the accustomed round of duty, or of pleasure; and the stream of city life bid fair to flow back along its old bed, with renewed and uninterrupted vigour.

The newly-kindled hope was deceitful. The great plague returned, indeed, no more; but what it had done for Londoners, the great fire, which broke out in the autumn of 1666, did for London; and in September of that year, a heap of ashes and the indestructible energies of the people were all that remained of the glory of five-sixths of the city within the walls.

Our forefathers had their own ways of accounting for each of these calamities. They submitted to the plague in humility and in penitence, for they believed it to be the judgment of God. But towards the fire they were furiously indignant, interpreting it as the effect of the malice of man—as the work of the Republicans, or of the Papists, according as their prepossessions ran in favor of loyalty or of Puritanism: all their hypotheses were alike wrong; the plague was no more, in their sense, Divine judgment than the fire was the work of any religious sect; but they were themselves the authors of both plague and fire, and it rested with themselves to prevent the recurrence of calamities to all appearance so peculiarly beyond the reach of human control—so evidently the result of the wrath of God, or of the craft and subtlety of an enemy.

One may picture to oneself how harmoniously the holy cursing of the Puritan of that day would have chimed in with the unholy cursing and the crackling wit of the Rochesters and Sedleys, and with the revilings of the political fanatics, if any plain-dealer had gone on to say that if the return of such misfortunes were ever to be rendered impossible, it would not be in virtue of the victory of the faith of Laud or of that of Milton, and as little by the triumph of republicanism as by that of monarchy; but that e one thing needful for compassing this end, was, that the

people of England should second the efforts of an insignificant corporation, the establishment of which, a few years before the epoch of the great plague and the great fire, had been as little noticed as *they* were conspicuous. But so it was: half a dozen young men, studious of the "New Philosophy," who met in each other's lodgings in Oxford or in London, in the middle of the seventeenth century, became the founders of the "Royal Society for the Improvement of Natural Science," a society which has ever since exercised so powerful an influence in originating and advancing everything calculated to promote the intellectual, moral, and material interests of humanity. Through that and similar associations we have learned that pestilences will only take up their abode among those who have prepared and kept unswept and ungarnished residences for them. Their cities must have narrow, unwatered streets, foul with accumulated garbage. Their houses must be ill-drained, ill-lighted, ill-ventilated. Their subjects must be ill-washed, ill-fed, ill-clothed. We now have learned somewhat of nature, and partly obey her. Because of this partial improvement of our natural knowledge, and of that fractional obedience, we have no plague; because that knowledge is still imperfect, and that obedience still incomplete, typhus is our companion and cholera our visitor. But it is not presumptuous to express the opinion that when our knowledge and obedience are complete, cholera and typhus shall disappear as the plague has.

From this cause we know, also, that though London contains tenfold the inflammable matter that it did in 1666; though its rooms are filled with wood-work and light draperies; though inflammable and explosive gases are in every street and every house, yet, so admirable are the engines furnished by the improvement of Natural Science, a street is scarcely ever burnt down; and where fire does occasionally afflict severe damage, the progress of natural knowledge in mathematics, and the accumulation of wealth in virtue of other natural knowledge, have been such, that the loss is generally compensated by societies.

In connexion with the *material* advancement from the increase of natural knowledge, it may be asked, "What of the inner life of the people?" and many, it is to be feared, would answer, it is neither purer nor more fervent in religious faith than the generation which produced a Boyle, an Evelyn, a Milton. The mud of society may be found at the bottom instead of at the top, but the sum-total is as deserving of swift judgment as at the time of the restoration; and there is no reason to believe that it is the improvement of faith or morals which keeps the plague from our cities, but that it is the improvement of our natural knowledge. This many might probably say; but I will venture to assert, that whatever direction the improvement of natural knowledge has taken,—however low the aims of those who have commenced it—it has not only conferred practical benefits on men, but, in so doing, has effected a revolution in their conception of the universe and of themselves, and has profoundly altered their modes of thinking and their views of right and wrong. These opinions I have long entertained; but I have lately found them so lucidly expressed by *Huxley*, in his lay sermon on the "Advisableness of Improving Natural Knowledge," that I have submitted them to you very nearly in the language which he has used, and I shall conclude this paragraph with his very words, which I most fully endorse:—"I say that natural knowledge, seeking to satisfy natural wants, has found the ideas which can alone still spiritual cravings. I say that natural knowledge, in desiring to ascertain the laws of comfort, has been driven to discover those of conduct, and to lay the foundation of a new morality."

What the new morality is, has been admirably pointed out by Lord Macaulay, in his review of the life and writings of Lord Bacon. He there shews that whilst the old philosophy disdained to be useful, and was content to be stationary, two words form the keystone of the new—Utility and Progress. He illustrates this by reference to the philosophy of the heathen Seneca and the Christian Bacon.

"Philosophy," says Seneca, "teaches us to be independent of all material substances, of all mechanical contrivances. The wise man lives according to nature. Instead of attempting to add to the physical comforts of his species, he regrets that his lot was not cast in that golden age, when the human race had no protection against the cold but the skins of wild beasts, no screen from the sun but a cavern." Bacon, on the other hand, assumed that the well-being of the human race was the end of knowledge. To make men perfect he did not aim at; but his study was to make imperfect men comfortable. "The beneficence of his philosophy resembled the beneficence of the common Father, whose sun rises on the evil and the good, whose rain descendeth for the just and the unjust." Plato thought man was made for philosophy: in Bacon's opinion, philosophy was made for man; nothing was too high or too low for its scope, that would tend to increase the comfort and mitigate the pains of mortals. Bacon's philosophy was built on a rock, being based on the beneficent spirit of Christianity, which in our day has moved philanthropy to shew itself in founding hospitals for the relief of the aged, the infirm, the sick and distressed; in establishing institutions for the deaf, dumb and blind, so that still, actuated by pure religion, and enlightened by natural knowledge,—that is to say, by a knowledge of the natural laws—humanity is able to make the deaf hear, the lame walk, the blind see, and the poor have the gospel thus practically preached to them.

I have had an object in making these remarks in connexion with the Royal Society, because I wish to institute a comparison between it and our own comparatively insignificant and unknown association; and it is my intention to do it in such a way that I trust I will escape the charge of presumption. "*Magna componere parvis*" is quite legitimate, when it is freely admitted at the outset that "one star exceedeth another in brightness." Admitting, then, that the Royal Society is as the sun in the firmament of science, and that ours is but a star of the lowest magnitude, I am

prepared to shew, and I wish to shew, that in its smaller sphere it has diffused its due proportion of light, and that it is still capable of giving the light and warmth which its founders intended it should impart.

If you look at the objects which the Royal Society had in view, and turn to our charter, you will find that they are very much alike; and further, if you examine the "Transactions" of both, the subjects treated are similar, and are such as, to use the language of the great Utilitarian philosopher Bacon, tend to "the multiplying of human enjoyments, and the mitigating of human sufferings;"—"to endow human life with new inventions and powers."

When you read in the first volume of our "Transactions" the papers by Wilkie, Sewell, Sheppard, Hall, Fletcher, Savage, Baddeley, Cochrane, Noble, and others, you may not say, "in those days there were giants in the land," like unto the giants of the Royal Society; but you are impressed with the idea that you are in communication with men of earnest, vigorous and acute intellect, who had very much at heart the furtherance of the good work in which they were engaged; and if we look at the more recent labourers in the field, we will certainly find nothing of which to be ashamed.

I shall now proceed to take a glance at some of the principal events of the past eventful year, and see if our Society has exercised any influence upon them, or if from their study we can add to our experience.

THE RED RIVER INSURRECTION.

The first to which I shall allude is the unexpected and unfortunate insurrection at Red River, which gave rise to several "untoward events" which we must all deplore. The constitution of our Society wisely prevents us from discussing

matters political or religious, and I only introduce it for the simple purpose of recording an historical fact and a circumstance connected with moral training and management, well worthy of note in our "Transactions." Colonel Wolseley, who directed all the movements of the mixed force of regulars and Canadian volunteers comprising the expedition which the joint wisdom of the Imperial and Dominion Governments deemed it prudent to send to Fort Garry, has used this language : "I have campaigned in many parts of the world, but I never saw men before go through such incessant labour. For days together the men were wet through. They had at times to work up to their waists in water; and during the months of July and August, fine weather was the exception, and rain was the rule. Great as was their labour, and trying as was this exposure, I never heard a mumur from any one. Officers vied with the men in carrying heavy loads, and the praiseworthy rivalry between the regular troops and the militia, in their eagerness to get forward, enabled me to reach our destination earlier than I had at one time anticipated. *My temperance friends will learn with pleasure that this was one of the few military expeditions ever undertaken where spirits formed no part of the daily ration. There was a large allowance of tea instead; and notwithstanding the melancholy forebodings of some medical officers, the result was a complete success. There was a total absence of sickness and crime.*"

The names of two members of this Society, Mr. A. R. Roche, late of the Crown Lands Department, and Mr. Simon Dawson, of Three Rivers, Civil Engineer, are identified with the Nor-West ; Mr. Roche having directed public attention to it, and having appeared before a committee of the Imperial Parliament upwards of twelve years ago ; and Mr. Dawson having been the engineer of the road, the greater part of which was traversed by the military expedition, and which, notwithstanding all that has been

said to its disparagement, has since been acknowledged by competent judges to have been as good as any new road possibly could be, subjected as it was to the transport over it of very heavy loads, in most unfavorable weather.

THE FENIAN INVASION.

The cry of "wolf! wolf!" had been raised so often in the early part of the season, that when the telegraph brought us the news on Tuesday, 24th May, that the Fenians had actually crossed the border at several points in the Province of Quebec, it was hardly credited; and the citizens of Quebec only began to realize the fact when they learned that the 69th Regiment had actually started by rail during the following night for the scene of action. Very conflicting reports were in circulation, and much doubt and anxiety existed, till all fears were removed by the communication, by the lady who had received it, of the following telegram:

"HINCHINBROOK, Friday, 27th, 3.55 P. M.—Engaged the enemy this morning. Drove them back with great loss—only escaping annihilation by seeking protection across the frontier. They lost arms and accoutrements, &c. All in good spirits."

This telegram proved to be substantially correct; and when it was subsequently ascertained that though the Rifle Brigade, under the orders of Lord Alexander Russell, with Prince Arthur on his staff, had also hastened to the frontier, to the expected post of honor and danger, yet that our own volunteers had gallantly routed the invaders, Colonels Bagot and Lord Alexander Russell having wisely given them the right of attack, while closely supporting them, a justifiable pride was excited in all our breasts, which was manifested especially by the enthusiastic reception given to the 69th on their return on the morning of the 31st, after the complete collapse of the attempted invasion. Thus

happily terminated their brief campaign of six days, which was appropriately closed by the following order from General Lindsay:

"HEAD-QUARTERS,
"MONTREAL, *4th June*, 1870.

"*General Orders, No.* 1.

"Canada has been once more invaded by a body of Fenians who are citizens of the United States, and who have taken advantage of the institutions of that country to move without disguise large numbers of men and warlike stores to the Missisquoi and Huntingdon frontiers, for the purpose of levying war on a peaceful community.

"From both these points the invading forces have been instantly driven with loss and in confusion, throwing away their arms, ammunition, and clothing, and seeking shelter within the United States.

"Acting with a scrupulous regard to the inviolability of a neighbouring territory, the troops were ordered to halt, even though in pursuit, upon the border.

"The result of the whole affair is mainly due to the promptitude with which the militia responded to the call of arms, and to the rapidity with which their movements to the front were carried out, and the self-reliance and steadiness shewn by this force as well as by the armed inhabitants on the frontier.

"The regular troops were kept in support, except on the Huntingdon frontier, where one company took part in the skirmish.

"The proclamation of the President and the arrival of the Federal troops at St. Albans and Malone, were too late to prevent the collection and transport of warlike stores, or an inroad into Canada.

"The reproach of invaded British territory and the dread of insult and robbery have thus been removed by a handful of Canadians; and the Lieutenant-General does not doubt that such services will receive the recognition of the Imperial Government.

"The Lieutenant-General congratulates the militia upon this exhibition of their promptness, discipline, and training; and in dismissing the men to their homes, he bids them carry with them the assurance that their manly spirit is a guarantee for the defence of Canada.

"By order, "J. E. THACKWELL, D.A.G."

In connection with this subject of the defence of the Dominion, it may be mentioned that on the 1st of April,

1864, one of our Vice-Presidents, Mr. Edmund A. Meredith, read a paper, since published in our *Transactions*, "*On Short School Time, with Military or Naval Drill, in connection especially with the subject of an efficient Militia System.*" The sentiments there expressed, and which originated in Mr. Chadwick's communication on the same subject to Mr. Senior, are well worthy, at the present time, of the earnest attention of those in authority in our Militia Department.

PRINCE ARTHUR.

Our record would be incomplete were I to omit special mention of Prince Arthur's sojourn among us, during the greater part of the past year. It will not be necessary for me to tell

> "How he looked when he danced,
> When he sat at his ease,
> When his Highness had sneezed,
> Or was going to sneeze;"

but I may say that his whole visit passed without a single *contre-temps;* that whether in his intercourse with those in authority, his communications with learned bodies, his meetings with our people in public balls, or in his relations in society of a more private character, he at all times shewed himself an amiable, courteous and sensible prince. There can be no doubt that this clear record, though mainly owing to his own excellent disposition, was largely brought about by the wise and prudent counsels of his governor, Colonel Elphinstone. His first reception by the colonists was favorable to him, not merely as the son of our Queen, but as "the son of his mother," respected on account of her womanly virtues; but the feeling of good-will deepened the longer he remained with us; and there can be no doubt that when he gave expression of *affectionate farewell* on the ordnance wharf, before embarking for England, the sentiment was echoed through the length and breadth of our land.

Prince Arthur's presence in Quebec gave occasion to one of the most imposing and pleasing ceremonies ever witnessed here: I mean the presentation of colors to the 69th Regiment, and to the depositing the old ones, the following day, in the Protestant cathedral. It has been generally thought that the latter ceremony would have been complete without any make-believe child's-play; and some have profanely said that they were reminded by that portion of it of the negro song:

> "Who's dat knockin' at de door?
> Is dat you, Sambo? No; 'tis Jim!
> You're not good-lookin',
> So you can't come in!
> Dere's no use knockin' at de door any more;
> Dere's no use knockin'!"

But, nevertheless, all who witnessed these ceremonies will look back with pleasure in connecting them with Prince Arthur, Colonel Bagot, and the officers and men of the 69th Regiment.

THE PRINCESS LOUISE.

The announcement of the intended marriage of the Princess Louise, fourth daughter of the Queen, with the Marquis of Lorne, eldest son and heir of the Duke of Argyle, has taken the nation by surprise, but at the same time has caused a very general feeling of satisfaction. The feeling of surprise was produced by the unexpected departure of Her Majesty from that policy which she has hitherto pursued in reference to the Royal Marriage Act, to which it may be interesting to make a short reference here.

In 1771, the Duke of Cumberland, one of the brothers of George the Third, had privately married the widow of Christopher Horton, Esq., of the County of Derby. When it was publicly announced, the King forbade them the Court. On the following year, another brother, the Duke of

Gloucester, acknowledged that he had been married to the Countess of Waldegrave since 1766. King George was highly incensed, and at once sent a message to Parliament, which, after much opposition, led to the passage of a bill which declared that none of the Royal family, under the age of twenty-five, should marry without the King's consent; but that on attaining that age, they were at liberty, in case of refusal, to apply to the Privy Council by announcing the name of the person they were desirous of espousing; and if within a year neither house should address the King against it, the marriage might be legally solemnized; but all persons assisting at or knowing of an intention in any of the Royal family to marry without complying with the Act, and who did not disclose it, should incur the penalties of a *premunire*. The bill was always distasteful to a very large portion of the British people, but it was carried by the great power of the Court. May, in his "Constitutional History," has written:—"The arbitrary character of the bill was conspicuous. It might be reasonable to prescribe certain rules for the marriage of the Royal family,—as that they should not marry a subject, a Roman Catholic, or the member of any Royal house at war with the country, without the consent of the King; but to prescribe no rule at all, but the absolute will of the King himself, was a violation of all sound principles of legislation. Again, to extend the minority of the Princes and Princesses to twenty-five, created a harsh exception to the general law in regard to marriages."

Among the numerous squibs of the day, the following is given as a fair sample. A Prince may ascend the throne at eighteen, and the reason why is thus given:

> "Quoth Dick to Tom: Thou art a fool,
> And little knowest of life;
> Alas! 'tis easier far to rule
> A kingdom than a wife."

It is painful to look at the consequences of this bill, in connexion with the children of its author. With one or two

exceptions, the careers of his sons were marked by profligacy and libertinism ; and in the fate of his sisters and daughters we find little more encouraging. It is true, the lives of none of them were defiled by immoralities, such as brought merited obloquy on their brothers; but blighted affections and broken health embittered the lives of some, while *state* marriages, or enforced celibacy, had an equally sinister effect on others. Who can doubt that these touching lines, written by the Princess Amelia, shortly before her death, came from the heart ?

> " Unthinking, idle, wild and young,
> I laughed, I danced, I talked, I sung,
> And, proud of health, of freedom vain,
> Dreamed not of sorrow, care or pain,
> Concluding, in these hours of glee,
> That all the world was made for me ;
> But when the hour of trial came—
> When sickness shook this trembling frame—
> When folly's gay pursuits were o'er,
> And I could dance and sing no more,
> It then occurred how sad 'twould be
> Were this world *only* made for me."

Having alluded to the dire effect of the law on the children, let us look back to the Duke of Gloucester, and mark the effect of his marriage on him. On referring to the *Annals of George III.*, we find this notice :—" On the 25th August, 1805, died the Duke of Gloucester, brother to the King, a prince much respected for his public and private virtues, and who had not sustained the slightest degradation in the view of the English nation, by his marriage with an English lady, or by giving his son an English in preference to a German education."

The Queen has secured the sympathy of her people by the wise course she has pursued in the education of her children, which has made them truly English ladies and gentlemen. The present step shews that while she has consulted the

feelings and affections of her child, she has kept pace with, if not placed herself in advance of the opinions of her people, indicated, I believe, by universal approval.

In connection with this subject, I may quote a verse from Burns' *Dream*, written in 1796:

> "Ye, lastly, bonnie blossoms, a',
> Ye Royal lasses dainty;
> Heaven mak you guid as well as braw,
> And gie ye lads a' plenty;
> But sneer na British boys awa',
> For Kings are unco scant, ay,
> And German gentles are but sma';
> They're better, just, than want, aye,
> On onie day."

I cannot refrain from giving also an extract from "Our Life in the Highlands," by the Queen:

"Our reception (at Inverary) was in the true Highland fashion. The pipers walked before the carriage, and the Highlanders on either side, as we approached the house. Outside stood the Marquis of Lorne, just two years old, a dear, white, fat, fair little fellow, with reddish hair, but very delicate features, like both his father and mother; he is such a merry, independent little child. He had a black velvet dress and jacket, with a "sporan," scarf, and Highland bonnet."

It will not be inapropos to cite *Mr. Punch* among the prophets:

"*3rd February*, 1849.—*Picture of England in* 1869.—We have heard it stated that the august mother and father of a numerous and illustrious race, whose increase is dear to the heart of every Briton, have determined no longer to seek for German alliances for their exalted children, but to look at home for establishments for those so dear to them. More would be at present premature. We are not at liberty to mention particulars; but it is whispered that H. R. Highness the Princess Boadicea is about to confer her Royal hand upon a young nobleman, who is the eldest son of a noble peer, who is connected by marriage with our noble and venerable Premier, with the Foreign and Colonial Secretaries, and with his Grace the Archbishop of Canterbury."

The most remarkable feature in this statement, which is about to be almost literally realized in the marriage of the Princess Louise with the Marquis of Lorne, is, that it was intended to convey the idea of what Thackeray, the writer, considered ought to be, but what he thought was very improbable; but, strange to say, two other circumstances alluded to in the same article, and in the same spirit, have also come to pass. Among the names of persons given in the *Gazette* of the period as having attended a banquet in high life, are those of "Lord and Lady Disraeli, the Countess of Stockport, and the Ladies Cobden."

It is true, Mr. Disraeli declined a peerage for himself, but accepted it for his wife; and though Mr. Cobden, who filled so large a space in the eye of the world, has died before his time, his colleague, Mr. Bright, if he has not accepted a peerage, may be now seen, if not actually at Court, in a Court dress in the columns of *Punch*, and is now the Right Honorable John Bright.

I trust we may congratulate ourselves on the belief that this step, taken by the Queen, is the virtual abrogation of an unnatural, if not immoral law—a law which never commended itself to the mass of the British people, and which was only defended by the Court on the ground of expediency, and the necessity for which has happily been found no longer to exist.

THE ECLIPSE OF AUGUST 7TH, 1869.

The total eclipse of the sun of August 7th, in 1869, attracted very general attention, and several expeditions were sent out by various governments to observe and report on it. It so happened, that, through the instrumentality of our senior Vice-President, Commander Ashe, the superintendent of the Observatory here, the Dominion Government was induced to send a party under his control to Jefferson City, in the far west. Commander Ashe selected as his consorts our then

President, the Revd. James Douglas, and Mr. Falconer, of Bath, England; and on his arrival at Jefferson, he had the good fortune to be joined by Mr. Vail, of Philadelphia, and Mr. Stanton. Captain Ashe reports: "By Friday night all preparations were made, and we retired to rest with great doubts about having a fine day. However, Saturday came at last, and the morning was hazy and overcast; but about eight the clouds began to break, and Mr. Vail and I took observations for 'time.' The afternoon was cloudless; but still a haze near the horizon. At half-past three, we 'beat to quarters.' Mr. Douglas shut himself up in the dark room; I took charge of the telescope; Mr. Stanton, with a light cloth, covered and uncovered the 'object-glass;' Mr. Vail had his telescope nicely adjusted; and Mr. Falconer was seated in a very good position to observe the dark shadow crossing the country, and to note any other phenomenon. At 3h. 38m. 40s., local mean time, the first contact took place, and the first photogram taken, shewing a slight indentation on the sun's limb. We took the partial eclipse with an eye-piece, giving a three-inch picture; but as it was hazy, I removed it before totality, and took the photograms in the principal focus."

You will observe that the eclipse occurred in 1869; consequently, it cannot be recorded as an event of 1870; but as our Vice-President was the astronomer, and our then President the photographer of the expedition; and as their papers on the subject, which enrich this year's Transactions, were read to the Society in the session of the present year; and further, as Captain Ashe's report has given rise to a controversy still undecided, I think I can introduce it to your notice quite legitimately; and I have great pleasure in directing attention to Mr. Douglas's paper on "Recent Spectroscopic Observations of the Sun, and the Total Eclipse of August 7th, 1869," which will be found to contain the most valuable information on the subject down to the present time; and to Captain Ashe's paper, entitled "The Canadian

Eclipse Party, 1869," which a distinguished American astronomer has styled "A draught of sparkling Astronomy," and which goes

"From grave to gay; from lively to severe."

I shall only further say, here, that Mr. De la Rue, the Astronomer Royal, and some American astronomers, have taken exception to Commander Ashe's photograms, alleging that their most interesting feature arose from movement of the telescope. Captain Ashe still holds, with some reason, to the reliability of his photogram, and is able to give mathematical proofs for his belief, and has certainly got his opponents on the hip,—one having clearly pointed out that the telescope must certainly have moved to the *right;* while an equally high authority, who supports him, avers that it undoubtedly moved to the *left*—which involves an awkward contradiction.

The Royal Society commenced observations on the spots of the sun two hundred years ago; and since then a host of eminent men have successively given their views, including among the more recent observers in England the younger Herschel, De la Rue, Lockyer, and a host of others; on the continent, Frauenhofer, Jaunsen, Vogel; Professor Young, of Hanover, in the United States; and in Canada, our own Vice-President, Commander Ashe; and though they have done much, by the aid of the spectroscope, to shew what is the physical constitution of the sun, still it appears to me that as yet the darkness is rendered more visible.

The most noteworthy feature in the records of this, as of former eclipses, is the very wide range of differences in the estimates of the various phenomena. Thus, in the eclipse of 1842, M. Petit, at Montpelier, estimated the width of the corona at barely one-fourth of the moon's diameter; while Baily, who then first observed with attention the phenomenon since known as "Baily's beads," considered the corona

about twice as wide. To Struve, the Prussian astronomer, the corona appeared still wider. "It is interesting," says a writer in the "Cornhill," "to notice these discrepancies between the observations of modern astronomers of repute for accuracy and observing skill. It shews that the differences recorded in the aspect of the corona are not due to such errors as unpractised observers might be expected to make."

Whatever may be the extent of the corona—whatever may give rise to it, "it is a fitting crown of glory for that orb, which sways the planets by its attraction, warms them by its fires, and pours forth on all of them *the electric and chemic influences which are as necessary as light and heat for the welfare of their inhabitants.*"

We all have heard of the *odium theologicum*, and the great affection which the members of the medical profession bear to each other: we are told that hawks (that is to say, lawyers) will not pick out hawks' een; but when I read of the extraordinary things which some of these *celestials* allege they have seen, and the cool way in which their brother astronomers give them direct contradiction, I am lost, not "in wonder, love and praise," but in wonder and a *maze*. I am comforted, however, with the knowledge that I do not stand alone, for here is what another has written:

"*A Comfortable Prospect.*—The spots on the sun have given rise to much controversy among scientific men. Some hold the theory that the heat of the sun is maintained by the falling-in of planets, as lumps of coal are supplied to a furnace, and that the spots on the sun's surface are the furnace-doors open to receive the fuel, meteorites being pieces of slag thrown off, which become reduced to very small portions by the long journey they have to make. But some carry this a good deal further, and believe that a distillation of matter is to take place, and that the whole of the systems of worlds are to be reduced to ashes, and to be redistilled into a gaseous form, preparatory to a new creation taking place. The exact date of this event has not been given, but it is made out on purely philosophical principles. It appears to be something like the three wonderful Bedouin

brothers: one jumped down the other's throat; the second jumped down the throat of the third; and he, with superhuman exertion, jumped down his own throat, and disappeared from society. "Retardation," in the case of the heavenly bodies, is to do it all. Nothing can be simpler. By the process of "retardation" in space, all the planets must fall into the sun; the suns in their turn are to fall into each other, "each time" (how wonderfully accurate is science) "augmenting their heat-giving power as their *mutual* masses increase." There is something a little hazy about the word mutual, as so applied; but as the subject itself is a little hazy, it may pass. The result is what the unfortunate dwellers on the planets have to look to, and that is, as we have stated, that "ultimately"—how long is not stated, and Time is the great consoler—there is to be nothing in the world but gas. There is so much of it just now evolved in the public utterances of our great men, that really the theory does not seem to be so improbable as might be thought."

Addison makes Cato say:

> "The stars shall fade away, the sun himself
> Grow dim with age, and nature sink in years."

And another poet tells us:

> "The sun is but a spark of fire,
> A transient meteor in the sky."

Shakespeare also says:

> "The cloud-capt towers, the gorgeous palaces—
> Yea, the great globe itself, and all that it inheriteth—
> Shall dissolve, and, like the baseless fabric of a vision,
> Leave not a wreck behind."

Our religion teaches us, likewise, that this earth shall be destroyed by some mighty catastrophe—not by any slow process, however, but in the "twinkling of an eye."

I do not believe that the sun wastes his strength, and that he would become completely exhausted unless he were renovated by meteors and comets. I believe that, as in electricity and magnetism, where there is a double action continually going on, the same ray of the sun which sends

his heat to us also returns it to him; consequently, there is no waste. Byron, in his apostrophe to the Ocean, says:

> "Dark-heaving, boundless, endless, and sublime—
> The image of Eternity—the throne
> Of the Invisible.
>
> "Unchangeable, save to thy wild waves play;
> Time writes no wrinkle on thy azure brow;
> Such as creation's dawn beheld, thou rollest now."

What the "Great First Cause" is in general creation, I believe the sun is, in his own system, and that we may in truth apostrophise him in the words of Byron:

> "Such as creation's dawn beheld, thou rollest now."

Something more than barren theory is likely, however, to arise from the observations with the spectroscope into the physical constitution of the sun, if the following can be relied upon:

"*Use of Metals as Fuel.*—An English inventor proposes to substitute metals for coal as fuel for ocean steamers, and has taken out a patent for a method of carrying out his views, his object being to obtain a larger amount of steam from a given quantity of fuel. When coal is burnt, the solid coal is turned into gas; a large portion of heat becomes latent, and is wasted by volatilizing the solid. The oxygen of the atmosphere is a gas by reason of the large amount of heat combined with it. When zinc, iron, or manganese is burned, the resulting oxide is a dense solid; little or no heat is wasted, as it is not turned into vapour. In addition to this, the inventor obtains the cosmical heat latent in the oxygen of the atmosphere; and the result is, that one pound of zinc will evaporate more than four times as much water as one pound of coal, the advantage of which, on long sea voyages, is obvious. The zinc or other metal thus becomes a vehicle of power, much larger than can be obtained from the same weight or bulk of coal; and the oxide of the metal may subsequently be reduced at any convenient place where coal is accessible. The following is the manner in which it is proposed to carry out this invention:—The furnace of the boiler is divided into two or more parts: first, the hearth, or grate, on which the metal is burned (in this description we will confine ourselves to the metal zinc); secondly, a chamber behind the hearth to collect the oxide. In the case of tubular boilers, the heated gas from this chamber is made to circulate through the tubes. The

furnace has the bottom and sides, and sometimes the top also, of brick, fire-clay, or any other refractory substance. The air is admitted over the combustible metal, or a blast through the same; in the latter case pipes are built in the bottom or sides of the furnace.

"Whether this method will prove practically successful or not, it is certainly based on sound principles. Every one knows what a small proportion of coal, compared to the iron, is used in the furnaces of iron foundries, and how the partial combustion of the iron itself increases the heat derived from coal. If stoves could be built that would burn iron, it would doubtless be as cheap a fuel as coal, perhaps cheaper."

THE ŒCUMENICAL COUNCIL.

"There is not, and there never was, on this earth, a work of human policy so well deserving of examination as the Roman Catholic Church. The history of that church joins together the two great ages of human civilization. No other institution is left standing which carries the mind back to the times when the smoke of sacrifice rose from the Pantheon, and when cameleopards and tigers bounded in the Flavian amphitheatre. The proudest royal houses are but of yesterday, when compared with the line of the supreme Pontiffs. That line we trace back in an unbroken series, from the Pope who crowned Napoleon in the nineteenth century to the Pope who crowned Pepin in the eighth; and far beyond the time of Pepin the august dynasty extends, till it is lost in the twilight of fable." The opinions here expressed by Macaulay have been shared by many; and when it was announced, towards the close of the last year, that the Roman Pontiff, Pio Nono, whose lengthened and eventful reign had already been rendered remarkable by changes spiritual and temporal, not only within the territories of the church, but among the great nations of Europe which acknowledged his spiritual sway; when it was officially announced that a council of the dignitaries of that church, such as had not been held for three hundred years, h[illegible] summoned, and that the princes of the church were [illegible]

to Rome, from Greenland's icy mountains and Afric's golden sands, "all the world wondered," and the attention of thinking men, Protestant as well as Catholic, was excited, and continued with more or less interest to watch its proceedings from 8th December, 1869, its opening, to midsummer, 1870, when the long-disputed dogma of Papal Infallibility was affirmed, but not without opposition from a powerful minority.

THE PAPACY.

The Council had scarcely adjourned when the necessities of the Emperor Napoleon compelled the withdrawal of the French troops from Rome, and the 20th September will be ever held in memory on account of the surrender of Rome on that day to General Nino Bixio, the commander of the Italian army; and thus the temporal sovereignty of the Pope has apparently fallen,—having endured upwards of eleven centuries. Some have called this the fall of the Papacy, which others consider erroneous. The rules of our Society wisely prevent us from discussing matters religious and political, and this pertains to both; but it is not out of order to note the historical fact; and it may also be permitted to state that there exists much difference of opinion, not among Protestants only, but among Catholics themselves, on the question, some maintaining that the loss of the temporal power may involve the breaking-up of the whole grand fabric, and bring about the destruction of the spiritual power; while others as confidently assert that this was all that was wanted, and that the laying down of the temporal sword will increase the power of the sword of the spirit, and that all Catholic nations will henceforth yield to the spiritual Pope a more willing and thorough obedience. It must be noted, however, that Pio Nono himself has entered his most solemn protest against what he deems an act of spoliation, and that he has been joined in this by prelates of the Catholic Church in the British dominions as well as elsewhere.

OBITUARY.

As interesting Quebec, I may refer to the recent death of Archbishop Baillargeon, a man fervent in spirit, zealous in good works, of a deep but unostentatious piety, of great humility, and abounding in Christian charity. He was endeared to every member of his own church, and respected by the Protestant community.

Canada has also, this year, to deplore another "great man fallen in Israel," in the person of the late Revd. Alexander Mathieson, of St. Andrew's Church, Montreal, who ministered to its congregation for nearly half a century. His bearing to the community in general was marked by affability and courtesy; while his congregation looked upon him as a father. The poor were the especial objects of his care. His death marks an epoch, not only in St. Andrew's Church, but in the courts of the Presbyterian Church of Scotland in Canada, where he always occupied a prominent position.

In the general obituary, the world has to lament the premature death of Charles Dickens, the great novelist, moralist, and lay preacher, at a time when his sun was still shining bright in the high heaven of literature. It has been truly said, that in all that he has written, not an expression can be found which could raise a blush on the cheek of maiden innocence. It may be also alleged of this great magician, as of Shakespeare, that "all who have studied his successive approaches to perfection, must see that he united the closest study to the keenest observation; that he attained the highest pitch of dramatic art, and the most accurate philosophy of the human mind; and that he was a profound artist, and not a blind and wildly-luxuriant genius."

FIRE.

1870 will be ever memorable for the conflagrations which have devastated several portions of the Dominion.

On Tuesday, 24th May, at 1 a.m., a serious fire broke out in the suburb of St. Rochs; and notwithstanding the energetic exertions of the citizens, and the active aid of the soldiers of the garrison, before it was subdued, 300 houses were consumed.

Then followed the calamitous fire in the Saguenay district, which inflicted great suffering on the inhabitants, and which might have been much more severe had it not been for the energetic conduct of a few men connected with the district, who, by their prompt action with the government, and with their influence in the great cities of the Dominion, were enabled in a very short time to forward to the sufferers supplies that were needful.

The community had scarcely recovered from the alarm produced by these great fires in the Province of Quebec, when it was called upon to sympathize with Ontario under an equally great affliction. In Ottawa, Carleton, and North and South Lanark counties, the fire raged with terrible fury. I have been unable to lay my hand on the statistics in connexion with the fires in the Lower Province; but it is stated that in Ottawa county 240 families, in North Lanark 40 families, in South Lanark 60 families, in Carleton 600 families, in all 940 familles, were rendered homeless.

Some may look upon these visitations as direct from Providence. But with the experience of the past, who can doubt that they originated in the utter carelessness and improvidence of man, who, totally regardless of past experience, built up a suburb of materials which must sooner or later provoke its doom? It may be supposed that this assertion will not apply to the fires in the woods; but there can be little doubt that, though there was less criminality involved, they also originated in carelessness. I think that there was criminality in connexion with the fire in St. Rochs,

but I do not wish it to be inferred that I point to incendiarism; on the contrary, I think the criminality attaches not to those alone who erected the wooden buildings in defiance of the law of the land, but more to the municipal authorities, who closed their eyes to the fact that such buildings had been erected. Still greater will be the responsibility should in the future any buildings of combustible material be permitted to be erected within the limits of the Corporation.

THE EARTHQUAKE.

On Thursday, 20th October, I was sitting in my parlor in Berthelot street, reading a biography of the Archbishop which had appeared in the *Journal de Québec*. I had just reached the conclusion of the Archbishop's remarks to the students, and was reading its concluding words, "*Sic itur ad astra*," when I thought my Newfoundland dog had got into the room and was scratching himself below the table; but looking below, I found I was mistaken, and at once became sensible that it was an earthquake. I mechanically got up, and taking out my watch, and making allowance for a few seconds lost, I found that it was just 23 minutes past eleven: the force of the motion very much increased for about a minute, but I could not say that it was in any given direction. I cannot describe the motion better than in the language of Scripture: "the earth trembled and shook." At 24 minutes past eleven, the motion was so violent that my heart sunk within me, as I thought the house was about falling; at this moment my daughter came into the room, and, placing her hand on my shoulder, said, with accents and look of great terror: "Oh, father, I am dreadfully frightened." At that instant the force suddenly ceased, and I noted a slight tremulous motion for thirty seconds more, when everything was still. I held my watch in my hand for five minutes more, expecting a second shock, but there was no repetition. Nothing was displaced in the room, though everything, especially articles on the sideboard, participated in the motion. My sister, who happened to be in the hall, felt the

shock very slightly. The servant, had we not talked of it, said she would have thought it was only a cab passing. The shock was felt very differently in different parts of the city. Some estimate its duration at 30 seconds, some at three or four minutes; some felt two shocks after a short intermission, some only one, protracted, but increasing and diminishing in power. Mr. Peebles says it was felt very severely at the Gas-Works, and that there were two shocks, with a distinct interval. I am not aware of any one noting the time of duration by watch but myself. I asked Captain Ashe, who, I thought, would most likely have observed, and he told me that though he had an excellent opportunity of noting the time, having been in the Observatory, yet he was so absorbed with the violence of the motion that he had not thought of it, but he was under the impression that it had lasted about three-quarters of a minute. Putting all accounts together, it was the most severe shock felt for two hundred years in Canada; and if the accounts received are reliable, it was attended with great destruction of property and serious loss of life in the neighbourhood of "les Eboulemens" and St. Paul's Bay.

Dr. Smallwood, of the Montreal Observatory, has published some very interesting notes on the meteorological phenomena which he observed. According to his statement, the shock occurred at Montreal at 11.17, just six minutes in advance of Quebec; and the direction seemed to have been from S.W. to N.E., and the tremulous wave of motion was of ten or twelve seconds' duration; and after an interval of a few seconds, a second shock occurred, of less duration and of less intensity, lasting only from five to eight seconds. He gives the following account of his observations of the usual meteorological phenomena of the few days preceding the earthquake and up to two o'clock on Thursday afternoon, the 20th of October:

"Rain fell on the thirteenth day, followed by a rise in the barometer, and a splendid display of the aurora borealis on

the night of the fourteenth day. Numerous and very large spots were present on the solar disc, and which had been the case for some considerable time, more especially during the presence of the aurora on the nights of the 23rd, 24th, 25th and 26th days of last month (September).

"The maximum reading of the barometer at seven A.M. on the morning of the sixteenth day indicated 30.215 inches, and was succeeded by a very fine, warm day, the mean temperature of which was 63.9 degrees, wind S.W. Showers of rain fell on the 17th, from ten A.M. till three P.M., with a west wind, and with a falling barometer, which at nine P.M. of that day stood at 30.000 inches. From one A.M. of the 18th (Tuesday), a very rapid and sudden fall was observed, viz., 0.639 of an inch in six hours; and it attained its minimum, 29.361 inches, at seven A.M. on that day.

"From that hour, a gradual and somewhat sudden rise took place, accompanied by a very heavy gale of wind. The clouds were passing from the west, but the wind veered to all points of the compass. The register of the anemometer at the Observatory shews a complete disc of concentric circles, with a velocity varying from thirty-five to fifteen miles per hour.

"There was also a rise of 0.507 of an inch in the barometer, with a falling temperature. Frost occurred during the night, and a good breeze continued from the west. The thermometer at seven A.M. shewed 33.1 degrees, and the barometer 30.070 inches.

"From this time the temperature rose and the barometer fell, and this morning, at 7 A.M., stood at 29 4.99 inches. Rain set in during the night, and at 7 o'clock 0.214 of an inch had fallen: thermometer, 42 degrees; wind, S.W.; mean velocity, 3.14 miles per hour.

"At 11 h. 17 m., Montreal mean time, a very considerable shock of an earthquake was felt generally throughout

city; its direction would seem to have been S.W. to N.E.; the tremulous wave of motion lasted for from 10 to 12 seconds, and was succeeded by a slight interval of a few seconds, when a second shock occurred, of less duration and of less intensity, lasting from five to eight seconds. No wave of sound was perceptible, and the wave of motion was undulating and in a straight line (rectilinear), and of considerable elevation. Domestic articles rocked to and fro, but no damage to buildings has resulted.

"The magnets were very sensibly affected at 10.30.

"The barometer is still falling. At two P.M. it stood at 29.299 inches; thermometer, 44.8 degrees; wind S.W., with rain.

"Professor Kingston telegraphs me that the magnets at the Toronto Observatory shewed slight shocks at ten minutes to eleven."

N.B.—Though it was felt on the surface above a mine in the Eastern Townships, it was not felt in the mine itself. Quebec observers say the motion was nearly from east to west.

THE FRANCO-PRUSSIAN WAR.

When, early in the past summer, the Emperor Napoleon "cried havoc and let loose the dogs of war," the great powers of Europe generally disapproved of the step. The cry on the one side was, "on to Berlin!" on the other, "on to Paris!" and the records of public opinion shew that in whatever direction sympathy went, there was a very general feeling that, sooner or later, France would dictate terms to Prussia, in Berlin. The fortune of war has mocked to scorn all expectations; the speculations of the wise and of the foolish have been equally astray. We have seen two of the greatest nations of Europe, armed with the most destructive engines of war which the world ever saw, meet in the shock of battle, with armies outnumbering anything

in history. We have seen fair France devastated, and its mighty fortresses laid low; and turning to its Emperor, we involuntarily recall the words of Mark Antony:

> "But yesterday, the word of Cæsar might
> Have stood against the world; now lies he there,
> And none so poor to do him reverence."

When we read of the fervent prayers which hourly ascend from the altars in France, and the pious unction with which King William in his telegrams to his Queen thanks a kind Providence for victory, the shout of which is overpowered by the shrieks and groans of the wounded and dying, we can then see the force of what Jeremy Taylor wrote:—"I have lived to see religion painted on banners and thrust out of churches; the temple turned into a tabernacle, and God worshipped, not as the Prince of Peace, but appealed to as the Lord of Hosts. When religion puts on armour, and God is not acknowledged by his New Testament titles, religion may have in it the power of the sword, but not the power of godliness."

THE "CAPTAIN."

Among the disasters of the year stands prominent the loss of H. M. ship "Captain," which foundered off Cape Finisterre at 12.15 of the night of 7th September. Captain Burgoyne, her commander; Captain Coles, her projector; and all her officers and crew, amounting to 500 souls, perished, with the exception of second-gunner May and seventeen men. Captain Burgoyne was seen for some time on the bottom of the capsized steam launch, and several attempts were made to rescue him by the only boat saved; but, unfortunately, they were unsuccessful. The interest which Quebec felt in this sad accident was increased by Captain Burgoyne having been for a season in Quebec, in command of the "Constance," when he was well known to its society; and also, as among those who perished, was

Sub.-Lieutenant Herbert T. Murray, well and favorably known to many of us as a midshipman of the "Aurora" during the long period of her stay in this port.

The evidence before the Court of Enquiry leaves no doubt that her loss was occasioned by an error in the construction of her hull, which made her two feet deeper in the water than it was intended by Captain Coles she should have been; and also by her having been overmasted, which made her top-heavy when her topsails were set in the gale. This experience has been too dearly bought, as it has cost the lives of nearly five hundred men and half a million of pounds sterling. It is satisfactory to know that the Court not only acquitted Mr. May and the saved boat's crew, with honor, but awarded them great praise for their conduct and exertions to save their officers and comrades.

When I reflect on this terrible accident, and couple it with the equally awful cases of the "City of Boston" and the "Cambria," I recall and fully appreciate the well-known lines of Mrs. Hemans to the insatiable sea:

"High hearts and brave are gathered to thy breast!
They hear not now the booming waters roar;
The battle-thunder will not break their rest.
* * * * * * * * *

"Give back the lost and lovely! those for whom
The place was kept at board and hearth so long!
The prayer went up through midnight's breathless gloom,
And the vain yearnings woke 'midst festal song!
* * * * * * * * * *

"To thee the love of woman hath gone down;
Dark flow thy tides o'er manhood's noble head—
O'er youth's bright locks and beauty's flowery crown;
Yet, must thou hear a voice: Restore the dead, thou sea!"

PEACEFUL TRIUMPHS.

It is pleasing to turn from the record of great calamities to note the peaceful triumphs of industry, among which stand

prominent the success of the Suez Canal and the Great Pacific Railway, which, though completed and opened before the close of 1869, have really only been proved during the current year. To M. de Lesseps alone is justly due all the credit of the completion of the first; and it will ever stand, while it does stand, a monument of his skill, perseverance, and indomitable energy, and a reproof to politicians whose hostility retarded its construction for many years.

The Great Pacific Railway, in its grandeur, rivals the canal, and shews what can be done by a free people under an enlightened government. This great road got its charter and was commenced in 1862; its whole length, 1774 miles, was completed and the road opened on 10th May, 1869. Our wonder is not diminished when we know that it traverses the great American desert, and crosses the lofty Rocky Mountains; that it has 30 miles of snowsheds and 15 tunnels—one, 1½ miles long, through solid granite rock; and lastly, that by it we are now enabled to receive in Quebec, by regular mails, letters bearing the San Francisco post-mark seven days previous. Canada, during this time, has not been idle, as the numerous railroads now under construction in Ontario amply testify. We may note, also, the satisfactory progress made by the contractors of the "Intercolonial Railway," as detailed in the recent report of the commissioners,—a progress which leads us to hope for its completion within the time promised.

I must now allude to an undertaking rapidly approaching completion in the neighbourhood of Quebec, which, I believe, is calculated to exert a beneficial influence in itself, and will also incite to similar efforts in this part of the Dominion. I feel pride in saying that the "Gosford Wooden Railway" was the conception of a member of our Society, Mr. Charles Fitzgerald; that he was seconded by Mr. Oakes, late of the Engineer Department, and that its feasibility was established by Mr. Rickon, also of that Department. After these gentlemen had given it *being*, as it were, they were

encouraged in the effort by the enterprising contractor, Mr. Hulbert, whose great practical experience and sound judgment did much to secure its being undertaken on correct principles. The support of Mr. Joly, as a private gentleman, and his untiring efforts and influence in the legislature, ably seconded by Mr Speaker Blanchet, Mr. Lemesurier, Mr. Garneau, Mr. Henry Fry, and others, did everything else that was wanting. This is the true history of the Gosford Railway. It was originated by a member of our Society; the first public meeting in connection with it was held in our rooms; and though I freely admit I could do nothing else, I have some satisfaction in knowing that at that meeting I moved a vote of thanks to Messrs. Fitzgerald, Oakes and Rickon, wishing them "God-speed." I am gratified at their success, and pleased to find that other municipalities are following in their footsteps; and though I have never been so sanguine as to think that such undertakings are likely to yield a dividend, I firmly believe that the indirect benefits which they confer on the community fully justify liberal grants on the part of government and the municipalities, as have been so wisely given in the case of the Gosford Railway.

In mentioning the proposed "North Shore Railway," I shall simply say that the project is now under consideration by the legislature, and that there is some reason to hope that a way may be found by which a road suitable to the wants of so important a district may be built at no distant day; and I am also happy to say that one of our Vi ce Presidents, Mr. H. S. Scott, has already pointed out the wisdom of enquiring into modern views in this connexion before its plan and equipment shall be decided on; and in connexion with this, I may add that at the late meeting of the British Association the question of railways was discussed, especially as to the guage for the future. Mr. R. S. Fairlie asserted that a 3-foot guage had been proved to carry two-and-a-half-times as many tons of traffic as were

now carried over the 4-foot-8½-inch guage of the North-Western Railway, and this without an additional shilling for haulage. Every inch added to the width of a guage beyond what was absolutely necessary for the traffic, would necessarily add to the cost of construction, increase the proportion of dead weight, increase the cost of working, and, in consequence, increase the tariffs to the public: consequently, by just so much reducing the width of the line, railways could be made cheaply, and at the same time thoroughly efficient. There was no country too poor to have railways sufficient for its requirements, and they furnished the cheapest possible mode of transport.

Mr. J. B. Fell supported the narrow in opposition to the broad-guage principle, and also the application of the centre-rail system to mountain lines. To illustrate the economy and carrying capacity of a narrow-guage line, he had constructed a mile of line on an eight-inch guage, at Low Furness, in Lancashire, at a cost of £1,000. It was capable of carrying from 100,000 to 150,000 tons per annum, and it would run at the rate of fifteen to twenty miles an hour with steadiness and perfect safety. This plan of railway would be especially useful for military purposes in such expeditions as that of Abyssinia: he had submitted his plans to the war-office authorities, who had them now under consideration.

ECONOMIC INDUSTRIES.

Would time have permitted, I wished to have said something of the economic interests more immediately affecting Quebec; of the decline of shipbuilding; and of the new industries which some enterprising citizens have substituted —such as the great Shoe and Rubber Factories; the great Furniture Workshops; the Foundries and the Carriage Spring Factory; the Chemical Works for the production of Sulphuric Acid, &c., &c.; and lastly, the Harvey Hill Copper Mine, the Chaudière Gold Field, and the Iron Sand of the Moïsie; but I must defer this to another opportunity. Yet, I cannot omit the occasion to refer to a branch of industry

which, though almost inexhaustible and incalculable, and the products of which are always in unusual demand, are prosecuted by us with little vigor, and are almost left to our more enterprising fellow-colonists of Newfoundland and our shrewd and more go-a-head neighbours, the Yankees. I allude to the Fisheries of the St. Lawrence and the Labrador coast. It ought to be made known that a vast number of Newfoundland fishermen annually resort to the coast of Labrador for the prosecution of the Cod, Herring and Salmon Fishery. Some take their families, and remain on the beach till the month of October. They caught in 1869, on the Labrador coast:

Codfish, quintals	308,366
Herring, barrels	33,135
Salmon, tierces	250
Cod Oil, tons	288

The total yield of cod to Newfoundland in the year 1869 was 1,204,086 quintals of codfish, so that Labrador alone gave one-third of the catch. But besides this, fishermen from the United States and elsewhere caught large quantities, giving an estimated value of £1,000,000 sterling, and to the whole fisheries of the Gulf a total of £3,000,000 sterling, exclusive of home consumption; so that the annual product of the fisheries of British North America may be valued at about $15,000,000.

I have said that this source is almost inexhaustible, for Buffon tells us that a single pair of herring, if left to breed unmolested for twenty years, would yield a quantity, in bulk, equal to the size of our globe; but the fecundity of the cod is still greater, there having been found in the roe of one female no less than 8,000,000 eggs. The Grand Bank, which is six hundred miles long by three hundred in breadth, has been fished for 350 years without any show of exhaustion, Catholic countries alone receiving from it, annually, cod to the value of £500,000 sterling. Yet, as the Rockall, Faroe Isles and Great Doggar Bank have given decided indications of

failure, and as the cod is a fish of comparatively slow growth, only increasing from eight to ten ounces per annum, there may be danger of exhaustion; and it has become necessary to consider the propriety of establishing and enforcing regulations such as have been found necessary in connexion with the River and Lake Fisheries. I have seen it stated, with great satisfaction, that Messrs. McKay & Warner have now in process of building in their shipyard several vessels intended as the pioneers of a fishing fleet. Let us hope that we who are here to-night may live to see such fleets leave our harbour as are annually sent forth from the hundred flourishing ports of New England, and that we may be participators in that inexhaustible wealth which has converted the rock-bound and sterile coasts of that industrious country into gardens. This, I believe, would be the most satisfactory way of ending the "Fishery difficulty."

DISCOVERIES IN SCIENCE AND ART.

Great advancement has been made in chemistry by the discovery of cheap modes of preparing hydrogen and oxygen; by the extended use of the permanganates in bleaching and disinfecting; by the cheap manufacture and general use of the hydrate of chloral, which some view as only next in importance to chloroform; and in the production of ice, on a commercial scale, by the liquefaction of gases. In photography, the Alberttype has enabled us to take one housand prints a day with durable ink. Improvements have also been made in the manufacture of glass, and in the use of salts of baryta, fluor-spar, and salts of thalium, for optical purposes. Then we have metallic manganese in combination with copper—cupro-manganese, a white alloy, a substitute for German silver; and glycerine for the conversion of refuse sponge into elastic sponge, for mattrasses and cushions.

We have also discovered how to ventilate under-ground railway carriages; how to blow bundles of letters from pillar to post through under-ground tubes; how to make a good bright-green color without admixture of arsenic; how to

produce combustible flint; how to prevent the waste of water at drinking fountains; how to make a durable pavement of asphalt; how to render the surface of common roads more fit for traffic; how to manufacture mouldings, foliage, and statuettes, from a mixture of glycerine and litharge; how to make "*dynamite*" from nitro-glycerine and sand, possessing all the power of nitro-glycerine without any of its dangerous properties; how to utilize sewage, prevent boiler explosions, and the injurious action of lead pipes on water; how to send two messages along a telegraph wire (one from each end) at the same time; how to increase the break-power of railway trains, and thereby diminish the chance of accidents. These are among the notions, inventions and speculations which have been put forth during the past year; also, the new process, by Mr. Weldon, of manufacturing chlorine, in large quantities, by blowing large quantities of atmospheric air into the liquor under treatment.

SACERDOTAL STATISTICS.

I shall conclude by directing your attention to an item of statistics which must be of great interest. Mr. Lovell's Canadian Dominion Directory, now in course of publication, gives the following sacerdotal statistics:

Anglican bishops	10
Roman Catholic bishops	18
Church of England clergy	633
Church of Rome clergy	1226
Church of Scotland clergy	187
Other Presbyterians	464
Methodists	1067
Baptists	326
Congregationalists	76
Other denominations	174
Total	4181

This is, as nearly as possible, one clergyman for every 1000 inhabitants in the Dominion—men, women, and children.

P. S.—*The Eclipse of Dec. 22nd.*—Since the preceding paper was read, a total eclipse of the sun took place on the 22nd of December. It was looked forward to by astronomers with more than usual interest, as it was hoped that it would afford an opportunity of removing doubts and verifying observations not very satisfactorily completed at the last eclipse. The results have not yet reached us, further than that a general statement indicates that the observations were favorable, and confirmatory of views promulgated after the last eclipse. The British expedition met with a great disaster by the shipwreck of the vessel which was conveying its instruments to the Mediterranean. Common people awaited the eclipse on this side of the Atlantic with no little anxiety, as it had been predicted, on authority, that a great tidal wave might be produced, which might create great destruction on our coasts. Happily, this prediction was nowhere realized, and is already almost forgotten.

The Completion of the Mont Cenis Tunnel.—The completion of the Mont Cenis Tunnel on the 26th of December, coupled with the opening of the Suez Canal and the great Pacific Railway, has rendered our age one of great and wonderful engineering triumphs.

Paper II.—NOTES ON THE COPPER DEPOSITS AT HARVEY HILL.

By JAMES DOUGLAS, Junior.

(*Read before the Society, Dec. 21st, 1870.*)

We adopt Von Cotta's classification of mineral deposits into the four following divisions:

I.—Beds;

II.—Segregations;

III.—Impregnations;

IV.—Veins.

I.—*Beds* are regular deposits with well-defined limits, which were formed subsequently to the strata beneath and prior to the overlaying strata, except where the bed is still in course of formation, when, of course, there are no overlaying strata. An ore-bed, therefore, is a member of the series of rocks in which it occurs.

II.—*Segregations*, on the other hand, are irregular masses of definite limits, formed after the rocks in which they occur. Segregations of pyrites are found filling what were caves in limestones and small fissures in slates.

III.—*Impregnations* differ from segregations in not possessing definite limits, and from beds not only in not possessing definite limits, but frequently in the ore which composes them having been deposited subsequently to the formation of the rock in which it is found. Many instances of rocks impregnated with ore occur in Europe and on this continent. The ore may be distributed in sheets between the layers of slates, or scattered in grains throughout a bed of sandstone.

IV.—*Veins* differ from all these by being limited in length and breadth, but practically unlimited in depth. There are what are called *gash veins;* but these are segregations, not veins at all. True, veins fill fissures in previously-formed rock. They may be parallel with the strata, or cut them at any angle, accordingly as the rocks were split or yielded to the disturbing forces along the lines of stratification. The limit in depth of a true vein has never been reached. Veins taper away to nothing at either end, and vary in width, here bulging out and there contracting to a thread; but as yet, no shaft has been sunk deep enough to reach the point where a vein begins.

These several forms of ore-deposits are subject to endless modifications; and it is often impossible to say whether a given deposit can be classed under any of them. They also occur separately and combined, as might be expected, when we try to imagine the manner of their formation.

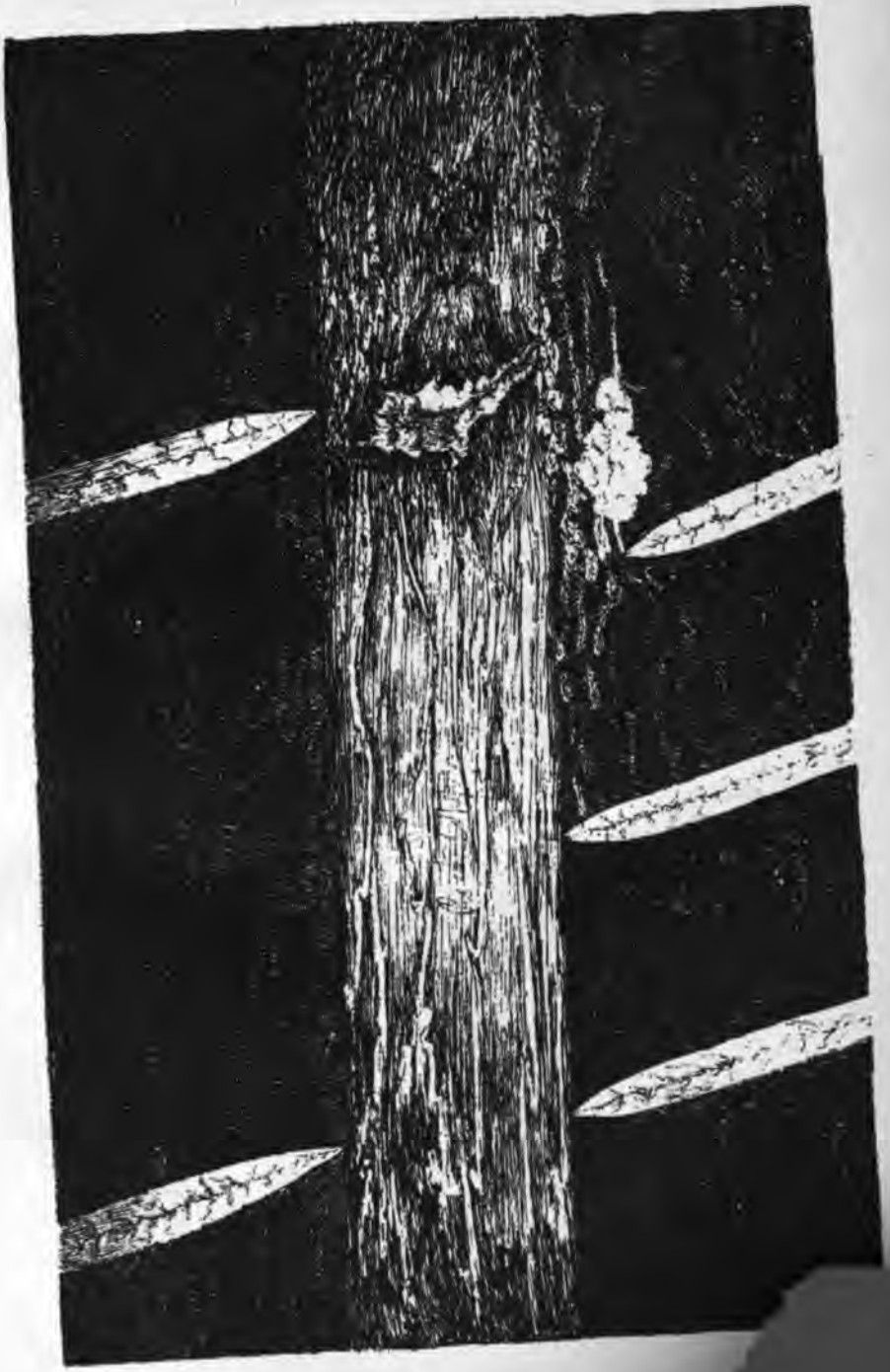
A bed we can easily conceive of as being formed from the mineral constituents of mineral springs, whose waters, after rising through fissures, collect into lakes. The same process is now going on, and beds of iron ore are forming in this very manner at the present day. A bed thus formed would be accompanied by a lode. The mineral sediment in the bottom of the lake would form the bed, and the same, filling the fissure by which the spring has reached the surface, would form the vein. The mineralized water would overflow the banks of the lake (unless evaporation went on as rapidly as it now does in the Dead Sea, where a vast bed of chloride of sodium is forming), and give rise to other lakes, in whose bottom the mineral would be deposited, forming beds, unassociated with veins; or, beside filling basins, it might find its way into crevices in slate-rocks or caves in limestone, and produce segregations. Subsequent geological changes might cover those beds with strata of slates or limestones, or of some igneous rock, as the case might be.

Veins and impregnations might reasonably be often looked for together.

If the stone impregnated with mineral be sandstone, we can conceive of its having become mineralized through the mineral solutions soaking through it, either from the surface or laterally from fissures in itself or neighbouring rocks. Most beds of sandstone were, however, probably mineralized at the time of their formation. The stream of mineralized water which, if sluggish, would give rise to a bed of solid ore, would, if rapid, disintegrate the rock over which it flowed, and deposit a sandy sediment with its mineralized precipitate; so we can also easily imagine the mineralized solution, if it should flow over a slatey bed, slowly percolating through the slates from the surface, and giving rise to an impregnated slate-bed unassociated with a vein; while we can as easily account for the instances in which impregnations in slates and veins occur together, by supposing a lateral percolation directly from a vein-fissure.

The mineral deposits at Harvey Hill afford a striking instance of impregnated slate-beds, accompanied by veins.

Attention was first directed to that locality as a mining region by the wonderfully rich outcrops of what appeared true lodes of copper ore. One of these was traced for nearly 100 fathoms along its strike; but they were all found to thin out in depth. Nevertheless, Mr. Williams (late superintendent of the English and Canadian Mining Company), satisfied of their being lodes, ran an adit for 248 fathoms through the Hill, midway between two principal groups of lodes. Most of the lodes run 20° E. of N., some few only nearly due E. Mr. Williams ran his adit 42° W. of N.; so that it certainly would have cut some of the lodes in depth had their course not been interfered with by the bed, as we shall subsequently see. Mr. Williams would have run his adit at a far lower level, and in a somewhat different direction, had he known what we know now; but his plans were not unwisely made from existing appearances.



In sinking a shaft, known as Frémont's shaft, on the summit of the Hill, on a lode which yielded for a time a great deal of ore, at 15 fathoms below the surface was found a layer of slate carrying copper pyrites; beneath this were some fathoms of barren slates, and then a thin layer of cuperiforous slates resting on a bed of steatite itself, sparingly impregnated with purple ore. In this part of the bed the ore is not of a workable quality; but it comes to surface in a depression of the Hill to the W., where a quantity of rich slates have been extracted.

Subsequently, another ore-bed was struck in grass-shaft No. 2 of the adit. It comes to surface at about 20 fathoms S. of the shaft. At its outcrop the slates carry about two per cent. of copper as yellow sulphuret; but when struck in the shaft, it yielded in places purple ore, and borings fairly made over an extent of several fathoms gave 3.5 per cent. of copper. It fell off in produce, though not in thickness, towards the W., and gave out altogether towards the E., so that work was discontinued at that point. This is unquestionably the same bed as was subsequently struck in Kent's shaft, 154 fathoms to the W.; and there is little doubt but that it extends over the whole intervening span, as it has been struck midway in a shaft begun by Capt. Williams, and completed since he left the mine.

Below the bed met with in the Frémont shaft (the 2nd bed), there is reason to think there occurs another, for copper-bearing slates were met with in the adit, at 20 fathoms from its extreme end.

There thus appears to be three beds, which, if they extend over the entire Hill, would exist at the following depths below the surface at Kent's shaft:

I. The uppermost bed, cut in grass-shaft No. 2, and from which a great deal of ore has been extracted by the Kent shaft, at 20 fathoms from the surface;

II. The second bed, that lying on the soapstone in Frémont's shaft, which should be at about 60 fathoms from the surface; and

III. The lowermost bed, that met with near the end of the adit, and which should be at about 20 fathoms deeper still, or at 80 fathoms from the surface.

There is, however, no likelihood of these beds being of such great extent, and it is certain they are not of the uniform richness at one time attributed to them.

It was in sinking Kent's shaft to strike two adjacent lodes, known as the Hall and Campbell lodes, in depth, that the first bed was struck, at 20 fathoms from the surface. It then yielded a percentage of copper, which tempted Captain Williams to open it up at a lower level. After, therefore, sinking seven fathoms further, he drove a cross-cut, and struck the bed, as expected, at a point where its yield was quite as good as at the 20-fathom level. At these spots, which happened to be peculiarly rich, through causes which will be apparent as I proceed, the slates, after being roughly picked over, yielded 3.5 per cent. to 5 per cent. of copper. Subsequently, levels were driven from the 20 and 30-fathom cross-cuts, both E. and W.: a cross-cut was run at 10 fathoms from the surface, till it struck the bed, and about 8,000 tons of crude ore broken between these different points. But the sanguine expectations entertained of the permanency of the yield have not been realized. Except towards the north, the bed has in no direction given out altogether; but in the other directions it has become so poor as not to repay the cost of extraction.

While working on the bed, however, discoveries have been made which have altered the whole aspect of the mine, and promise to enhance its value.

In driving the 30-fathom cross-cut, a mass of ore of irregular shape was met, which yielded 50 tons of 43 per cent. ore. It

thinned away to a mere stringer. In driving E. on the bed from the end of the 30-fathom cross-cut, another mass of ore was struck, which was concluded to be of the same description as the previous. But on following it, it proved to be a regular lode, though it was not for a long time recognized as such, so strong was the prejudice for lenticular masses. Capt. Williams drove an inclined shaft upon it for 40 fathoms, and stoped a considerable quantity of ore from the back and bottom, but abandoned operations on it till a vertical shaft should be sunk on it at a point further down the hill. Still, persuaded that the bed yielded on an average 3.5 per cent., he thought that operations could be most economically confined to it. For several years, while concentrating works were being erected, and after their destruction by fire, when on the eve of commencing work, reconstructed, no ore was raised. On their completion, last winter, the bed-ground was delivered at the works, unmixed with ore broken from the lode, and found to average considerably less than was expected.

Just then the unusual appearance of what was supposed to be a mere bunch of ore attracted attention in the slope to the W. of Kent's shaft. At its first appearance, it broke through the floor of the bed, and seemed as though it had discharged its copper into the lowermost layers of the copper slates; but, as it was followed in sloping the bed, it worked its way up through the slates, and assumed the features of a lode with well-defined walls, terminating funnel-shaped in the bed, and pouring its contents into the bed. One could trace the course of the streams of copper and bitter spar and calc spars, as they percolated from the lode among the slates. This at once created doubts of the old hypothesis, that the bed was the source of copper, and that the veins were merely gash-veins or segregations filled from the bed. One could hardly doubt the reverse being the case, or that the bed had derived its copper, quartz, lime, and magnesia, from the veins, which in that case would not be gash-veins

or lenticular masses, but must be true lodes. Subsequent operations and observations have tended to strengthen this view.

There seem to be several lodes entering the bed near Kent's shaft, all parallel in their strike, which is the same as that of most of the outcrops, viz., 20° E. of N. The only one on which much work has been done is the Fanny Eliza lode. As previously stated, where it was first noticed to carry copper was in driving E. from the 30-fathom cross-cut, at a point where the copper-bearing slates thinned away to nothing. The lode was then very small, but widened rapidly as Capt. Williams drove upon it.

The work now being done on the Fanny Eliza is at the end of the winze. The lode is from 20 inches to 24 inches in width, and very regular in both strike and dip, which is slightly to the W. The ore, as it comes to surface, yields from 8 per cent. to 12 per cent. of copper. It separates in crushing very perfectly from the gangue, and is, therefore, easily concentrated to from 40 to 50 per cent. It consists of a mixture of grey and purple sulphurets. When the lode enters the bed, it carries a good deal of yellow and no grey ore; but the yellow entirely disappears in depth. The ore occupies the centre of the lode, whose matrix consists of calc spar, some quartz, and a great deal of bitter spar, in whose composition iron replaces part of the magnesia. Very perfect crystals of bitter spar occur imbedded in the ore.

Tracing the lode upwards, but beneath the bed, and beyond the spot where it first attracted attention, it is seen in the 30-fathom cross-cut as a well-defined lode of about 8 inches wide, but carrying very little copper, and has been reached in a level driven upon it from the bottom of Kent's shaft, where, however, it is thin and irregular, though highly charged with copper. It does not enter the bed in at all the same manner as the lode previously described. In fact, the floor of the bed shews no indication of its existence beneath;

for when sunk upon, two fathoms of broken ground, consisting of alternate layers of quartz and spar, carrying rich bunches of ore and of slate, were raised before the lode assumed its regular form in strike and dip. In these shapeless masses of ore and spar are found chloritoid, sulphuret of molybdenum and quartz-crystals, with their angles rounded off as though they had been exposed to the action of a solvent. I have specimens of ore studded thickly with such crystals, some of which are several inches long, and as much as an inch in diameter, with their faces almost effaced and dimmed. The cavities in which these crystals rest are often coated with a greenish layer, which Dr. Hunt supposes to be a silicate of copper. These crystals are not found at any depth in the lode, but only in the irregular masses which occur in the disturbed slates beneath the bed, where, from some unexplainable cause, the regular fissures were interrupted by the bed; and the mineralogical solution they conveyed toward the surface, not finding a ready exit, forced its way through the slates. These, however, would act as a sieve, by which any solid particles, such as quartz-crystals, which the solution might carry in suspension, would be arrested. The only other spots where they occur thus rounded are at the outcrops of the lodes.

To the east of the Fanny Eliza two lodes enter the bed. Some work has been done on one of them. It appears to be cut by the bed, which severs it like a wedge. It runs parallel with the Fanny Eliza, and, like it, increases in size in the direction of its dip, but diminishes towards the rise. It appears, however, to proceed to surface above the copper-bearing bed, as though the bed had merely intervened without otherwise disturbing its course.

The only instance in which a lode has been found fairly cutting through the floor of the bed and retaining the distinctive characteristics of a lode, while in the copper-bearing slates, is that already referred to. It is at about five fathoms to the west of the Fanny Eliza lode, and

first appeared in the floor of the bed immediately west of the spot where that lode thins out; so that it is probably a continuation of the Fanny Eliza, which is there spliced. As it has been driven upon, it has gradually invaded the bed, spreading out fan-like, and discharging its contents in little rivulets among the slates. It carries purple ore, mixed with yellow. It is very interesting to notice how the slates gradually decrease in richness in proportion to their distance from the lode, and how the color changes from grey to black as the quantity of magnesia and lime in their composition decreases. In the immediate vicinity of the lode, the bed carries purple ore on the floor and yellow towards the roof, and the slates are nacreous. At five or six fathoms distant, there is nothing but yellow sulphuret of 32 per cent. richness, which at a greater distance changes into bell-metal ore of not over 25 per cent. produce; while the slates carrying the ore are the usual black slates of the region, and the magnesia does not to any great amount enter into their composition, but forms, with lime and the copper, very narrow bands between the layers. I shall not be surprised to find the bed cease to carry any copper as soon as the lode has quite cut through the roof. That the lode reaches the surface there is no doubt, as its position exactly corresponds with a very promising outcrop to the west of Kent's shaft.

In the eastern stopes, the bed became rapidly poor to the east of a lode, which, beginning in the roof as a little thread of ore, not three inches in width, rapidly increases in size as it rises towards the surface, which it reaches as the Hall and Campbell lodes. Probably, however, between the bed and the surface the lodes will not be found to be very uniform in width. They will probably also be much broken into branches, as the slates between the bed and the surface are seemingly less compact and more disturbed than below the bed, and would, therefore, fissure less regularly.

The characteristic features of the bed have been often described, though a thorough investigation of the composition

of the slates in the different parts is still a desideratum. But the facts above stated throw fresh light on its formation. There can be hardly a doubt that the Fanny Eliza is a true lode. It has not varied in direction or width for 40 fathoms; its dip is as regular as its strike, and, at places, distinct friction-surfaces have been observed. It is almost as certain that the veins which take their rise in the roof of the bed are lodes—not lenticular masses, inasmuch as their origin corresponds exactly in position with lodes which crop out upon the surface. It is, therefore, more likely that the bed received its copper from the lodes than that the bed fed the lodes. All appearances go to prove that the fissures which, filled with mineral, now form the Fanny Eliza and other lodes, discharged their liquid contents into the bed, and that, after percolating through the slates, what was not precipitated between their layers reached the surface through other fissures. The difficulty of explaining why the fissures did not extend through the bed and reach the surface direct, might induce one to suppose the slates and the copper they contain were simultaneously formed. In that case we might suppose the copper to have been derived from the deep lodes and precipitated among the slates during their formation. Subsequently, there might have been a further formation of slates, the fissures in which became filled with mineral derived from the bed, in the same manner as the lodes below the bed may have derived their contents from sources at still greater depth. This would not so well account for the poverty of the bed to the east of the surface lode, in the eastern stope, as the other hypothesis; for, had the surface lode derived its copper from the bed, there would have been impoverishment of the slates on both sides; whereas, the impoverishment occurs only to the E., that is, on the side furthest from the deep lodes, as though the deep fissures had injected into the slates their contents, which, being relieved from pressure by filling the surface fissure, did not impregnate the slates to any great extent beyond this fissure. There are no intrusive rocks or faults, or other marks, to

establish the relative ages of the surface and deep lodes; but the absolute uniformity in the direction of both their strike and dip would lead to the presumption that they were produced by the same disturbing force, and at the same time.

The experience gained at Harvey Hill should be of use in the exploration of other copper-beds along the same synclinal, so many of which correspond with it in their main features. At the present price of copper and cost of labor in Lower Canada, it is doubtful whether any of the copper-beds are rich enough to be mined with profit; but if they are all accompanied by lodes, in which the copper is concentrated instead of being distributed through 5 to 10 feet of slates (and the bed at Harvey Hill in places far exceeds 10 feet in thickness), many will be worked with profit. As at Harvey Hill, the vicinity of a lode will generally be detected by the increased richness of the slates, and the kind of ore hey carry.

If the two lower beds, known to exist on the Hill, extend at all beneath the uppermost, one would be anxious to know how they affect the deep lodes. The probability, however, is, that they are very limited in extent, as the second bed met with in Frémont's shaft was not cut in the adit, and that met with in the adit was not necessarily more extensive than a small bed of a few fathoms' extent close to surface to the west of Sayles' shaft, which divided its mineral from several veins cropping out through it.

Strictly speaking, therefore, these cuperiferous slates do not belong to beds at all, but should be classed as impregnations.

Paper III.—ON "CANADIAN ARCHIVES."

By HENRY H. MILES, D.C.L., LL.D.

(Read before the Society, Dec. 14th, 1870.)

I.—The subject of this evening's paper could hardly be expected to recommend itself, on the grounds of novelty or originality, to the attention of the members of the Literary and Historical Society; for the Society, in one form or another, has often had it under notice. Frequently, in the discussions which have taken place, the researches which have been prescribed to committees, and by the considerable expenditure incurred, it has manifested an anxious concern in relation to the foundations of our knowledge of the facts and events belonging to Canadian History. Some of the results, also considerable, are to be found in the published "Transactions."

But I here propose to present the subject from somewhat different points of view—not treading altogether on the old ground, and hoping to shew that there is still plenty of appropriate work for the Society to accomplish in the way of historical pioneering, and in the further prosecution of the legitimate objects of its mission.

II.—I shall first offer some preliminary observations on the subject of archives in general—taking this term to signify chiefly the records of facts and events which are of a more important and public character.

It would not be wholly irrelevant, if time and the occasion permitted, to speak at length of the various modes and processes to which mankind have in all ages had recourse for preserving the recollection of occurrences. [illegible] might advert to *oral tradition*, almost the sole m[illegible] practiced among barbarians, and embracing, a[illegible] advanced stages of society, the public rehearsal of [illegible]

on stated occasions to assemblies of men, in the shape of narratives in prose or song. But, though, to this day, so much of our knowledge of the past is allowed to be based upon tradition or mere *hearsay*, yet, for purposes demanding precise accuracy, and when great interests are at stake, we all know how often unreliable, indefinite, and even contradictory, is this sort of record, and that our confidence in it lessens with the lapse of time. I shall have occasion again to allude to such traditionary sources of knowledge further on.

Among the earlier inventions for recording facts, we might mention writing, or rather *engraving*, on the surface of various solid substances, such as stone tablets, tables of lead, copper, bronze, brass, wood, ivory, and thin sheets of wax. We read in Scripture of "the law of God written on tables of stone," and in Grecian and Roman History, of laws, orations and chronicles, engraved on plates of bronze and brass. Disraeli speaks of an Icelandic historian, who built a large wooden house, on the walls and spars of which "he scratched" the annals "of his own and more ancient times;" also, of another sage or hero, who thus had recourse to his chairs, benches, and bedstead, for the means of perpetuating the memory of his own exploits.

The Romans, however, found out, by experience, that the materials which were apparently the most durable in their nature were far from being the best adapted for the permanent preservation of records. Of this they had a signal proof. The code known as "The Laws of the Twelve Tables," were kept together with other chronicles engraved on brass in the capital. By a stroke of lightning they were instantaneously destroyed, some of the plates being melted, and the inscriptions on others rendered illegible. However, the use of thin tablets, composed of wood or prepared skins, and covered with wax, was very common amongst the Romans, and continued during a long period. Not only

epistolary and literary compositions were committed to these more fragile receptacles, but what we should now call official documents, as also wills, were inscribed on them. The same kinds of tablets used to be employed in the Roman schools in the instruction of youth, each scholar having his own set of implements,—one of these being the *style*, a small cylindrical instrument of iron, sharpened at one end and flattened at the other for convenience in making erasures. It seems that the style, in the hands of an irritable or combative person, sometimes became a dangerous weapon, since a law was passed, on account of its too frequent employment as a dagger, forbidding the use of iron styles altogether; so that others made of bone, horn, reeds, and so forth, came to be substituted. We read, for instance, of a school-master, who appears to have goaded his disciples into active hostilities which had a tragical termination, for his scholars felled him with their tablets, and then massacred him with their styles.

Long after the times here alluded to, even in England, tablets and styles were in use. We read in old Chaucer's writings:

> " His fellow had a staff tipped with horne,
> " A paire of tables all of iverie,
> " And a Pointell polished fetouslie, (whatever this may be!)
> " And wrote alwaies the names, as he stood,
> " Of all folke that gave hem any good."

I shall only allude, in passing, to the transition of those comparatively cumbrous modes into others more convenient for use, and even more useful in point of durability. The Egyptians made use of the bark of a plant which grew on the banks of the Nile, called *papyrus*, while the Chinese made a kind of paper with silk. In the course of time, these substances, also the prepared bark of other plants, linen, skins of quadrupeds and serpents, fashioned into parchment, came into use; and the processes of scratching or engraving on tablets gave place to the easier art of painting or writing

with different coloured liquids or *inks.* Of such materials, and by such means, were composed the *manuscripts* before and during the middle ages, comprising literature, archives, and records, up to the time when the introduction of printing, and of our present papers and inks, caused the more ancient processes to be set aside for ever.

Even on the subject of ancient and modern papers and inks, it would be well, in connection with the topic before us, to go into some useful details, if circumstances permitted. The papers manufactured in the present day are undoubtedly superior to those made two or three hundred years ago. The well known writer *Fuller* quaintly says, complaining of the preference given to foreign manufactures: "We do not enough encourage the making of paper amongst us; but, considering the vast sums expended in our land for paper out of Italy, France and Germany, our *home-spun* paper might be found beneficial. Paper participates, in some sort, of the characters of the country which makes it,—the Venetian being neat, subtile and court-like; the French, light, slight and slender; the Dutch, thick, corpulent and gross, sucking up the ink with the sponginess thereof."

But whatever may be the relative merits of the papers used at different periods, the composition of our inks is inferior to that of our forefathers. Modern records, in this respect, do not compare favorably with those made many hundred years ago. Having had occasion, during the last few years, to inspect written documents, including some despatches prepared in England and sent out to this country, and other records or copies written in Canada within the last hundred years, I have been struck by the indistinctness of many. Some, not even forty years old, present a pale, faded appearance, owing undoubtedly to the use of poor ink. On the other hand, persons who have had an opportunity in London of inspecting some of the ancient Saxon manuscripts, and the rolls and records which have

been preserved of the period from the year 400 to the 12th century, see that the written characters are bright and clear, and in the finest state of preservation; while, in this respect, there is a great falling-off in records belonging to the 15th, 16th and subsequent centuries. That ancient register of the lands of England, called the "Domes-day Book," prepared by the order of William the Conqueror, bears as the date of its completion, 1086. The first volume, a large folio of 382 pages, written in the same hand, in double column on each page, and the second, a quarto of 450 pages, single column, are both preserved to this day in their pristine freshness, fair and legible as when first written. Sir Francis Palgrave, formerly the Deputy-Keeper of Records, says of *Domes-day Book:* "In early times, precious as it was always deemed, "it occasionally travelled like other records, to distant parts. "Till 1496, it was usually kept with the King's Seal at "Westminster, with other valuable records, under three locks "and keys, in charge of the auditor, chamberlains, and "deputy-chamberlains of the Exchequer. In that year it "was deposited in the Chapter-House at Westminster, in a "vaulted porch never warmed by fire. From its first deposit "in the Treasury at Winchester, in the reign of the "Conqueror, it never felt or saw a fire; yet, every page is "bright, sound, and perfect."

It has been reasonably suggested that the less durable quality of modern inks, compared with those employed in writing the earlier records, is dependent on the neglect to use, in their composition, ingredients calculated to resist destruction by air and moisture. They are the same with respect to certain colouring matters and gum; but whereas modern inks have usually been made up with nut-galls, sulphate of iron, and gum, those more anciently used consisted chiefly of carbon, in the forms of soot and ivory-black—that is, of materials, under ordinary conditions, indestructible.

It would certainly be worth our while, if it were possible on this occasion, to advert to numerous other points

connected with the various modes resorted to in times past for making up and preserving the records of memorable events. But, however minutely this were done, the inevitable conclusion would be that, as regards mere materials, paper and ink are, in almost every point of view, preferable to all others that have been ever employed or thought of—more generally convenient for use, cheaper, more easily set in order and preserved, more easily searched, consulted, and replaced. We must admit that a light fabric derived from linen rags, with written characters inscribed, is, substantially, of a far more perishable nature than stone, clay, metal, and several of the other materials anciently used, and still appropriately resorted to, for certain kinds of memorials. Yet, the facilities which have just been indicated, and, above all, the means of multiplying copies to any extent which we possess in the *Printing Press*, now place mankind in a position to guard, if they will, against all known sources of accident, decay, and destruction.

III.—I shall now *revert*, for a brief space, to tradition, or oral communication, including what has been commonly styled *hearsay*, of which I have already spoken as a peculiar sort of Archive or fundamental source of information. We sometimes meet with persons who, because they have figured as actors in past transactions, or because they have derived their cognizance of these, at second hand, as it were, from conversation with others who did personally participate, set at nought all such accounts as do not square with their own views. It depends, I need scarcely say, much upon the nature of the transactions themselves how far evidence of that kind can be received as reliable, even when we have to deal with persons of undoubted veracity, intelligence, and freedom from undue prejudice. We may accept it readily enough in cases where an isolated fact, or single series of facts, is concerned. But if the case be that of a battle, a rebellion, or a course of important events implying the occurrence of many distinct incidents and the co-operation of many different

actors, the oral testimony of any *one* is really valuable only so far as it serves to assist in filling up a part of the outline embracing a narrative of all the facts. When the Duke of Wellington, shortly after the battle of Waterloo, was written to for information by a gentleman who stated his intention to write a complete history of that great conflict, he replied as follows: "The object which you propose to yourself is very "difficult of attainment. The history of a battle is not "unlike the history of a ball. Some individuals may "recollect the little events of which the great result is the "battle won or lost; but no individual can recollect the "order in which, or the exact moment at which, they "occurred, which makes all the difference as to their value "or importance. . . . . ." The suggestion contained in this reply is obviously applicable in a great many cases of individual testimony of the sort now adverted to. One's own personal experience or participation in a series of events may aid in correcting misstatements on certain points; but, to be of substantial and permanent value, a written record should be made at the time of or soon after their occurrence. To delay making that record until, perhaps, years have elapsed, or to leave it for a future generation to supply, is to weaken the character of such evidence, and cause it to assume more or less that of mere rumour.

In offering these last observations, I have had in view more particularly the difficulties which must encompass any attempts at present to get at the correct history of events which have transpired in this country during the past fifty or sixty years, until at least all the available written and printed records are looked up, collected and arranged, and their evidence sifted, as well as weighed in conjunction with the conflicting testimony of eye-witnesses and participators still living or recently decea- If, however, we limit our ideas of the nature of trad as consisting of oral testimony transmitted from f to son, or from individuals of one generation to tho

another, we have numerous instances in the history of Canada, as well as that of other countries, shewing its uncertain character when not supported by written records. Believing this to be a point of some moment in connection with our leading subject, I cite one or two examples.

We have a fair instance in English History of the account to which traditional evidence might have been turned if it were in all cases good for much. It is that of the Parr family. Thomas Parr was born in 1483, and lived till 1635, attaining to the prodigious age of 152 years. He had a son who died at 113, a grandson who lived to be 110, and a great-grandson who died on September 21st, 1757, aged 124 years. The period between the birth of Thomas Parr and the death of his great-grandson, Robert, comprehended the space of 274 years. But old Parr, when he was brought to London in 1635, to be presented to King Charles I., although then in good health, and in full possession of his mental faculties, seems to have had very little to impart respecting the events which had occurred in the course of his protracted life; nor are we informed that any of his long-lived descendants ever contributed anything to the existing stock of knowledge. Thomas, however, seems to have been quite uneducated and illiterate; and if the same were the case with his descendants down to Robert, the great-grandson, we might, perhaps, be allowed to infer that defective intelligence was a cause of the loss of so fair an opportunity of illustrating the nature and value of oral tradition. Nor do we find in Canadian History that the stock of knowledge was substantially increased by the aged Iroquois woman who is reported to have come on a visit to Quebec about the year 1742, when she was 138 years old. This venerable person is said to have afforded, by her visit, immense gratification to the inmates of the Ursuline convent, who beheld in her one who was of mature age when Champlain ruled in Canada, and who, they judged, must have received from eye-witnesses belonging to her own tribe accounts of the first

arrival of their foundress, Madame de la Peltrie, as well as of many other remarkable persons and incidents connected with the rise and growth of the Canadian Colony under the rule of no less than seventeen successive governors. It is reasonable to conclude that, considering she was a savage, and acquainted with all that was known of the past to her own people, she must have been an intelligent woman, and well able to make interesting disclosures. But if she did, these have not been placed on record.

Some time since, on the occasion of a visit to the General Hospital, I made use of an opportunity of conversing with one of the aged inmates of that institution. She appeared to be in possession of her mental faculties; and as she professed to remember incidents which occurred upwards of 80 years ago, I interrogated her on the subject of what have been styled "the dark days of Canada." One of these was Sunday, October 16th, 1785, and the two others the 2nd and 3rd of July, 1814. She said she recollected them, and that there had been an interval of about 30 years between the first and last. Finding her statement, so far, as correct as could be expected, I proceeded to question her further as to particulars. But I failed to elicit any other definite information, except the mention that she thought she was in fear on those occasions. Considering that the recorded phenomena of those dark days were remarkable enough to make a strong impression on the minds of the most ignorant persons, occasioning general alarm, and that the accompaniments of the first, such as the lighting-up of the churches and private houses in the day-time, might have been impressed on her memory, I was not prepared to find, as I did, that she recollected none of the particulars.

Quite of a different nature from the foregoing cases were those of the two well-known gentlemen named Thompson, father and son, of whom the latter, at an advanced age, died in Quebec last year. Mr. Thompson, senior, had been

present with Gen. Wolf at the first battle of the Plains, in the year 1759; and from the time of the occupation of the city by the British troops, in the autumn of that year, had remained a resident of it until his death, in 1830. In 1776, when Montgomery fell in an attempt to capture the place by assault, he superintended the interment of that general's remains. Forty-two years later, when he was about eighty years old, and when the widow of Montgomery reclaimed those remains, he was able, in the most perfect manner, to recall to mind all the particulars necessary for identifying the place of burial and for superintending the disinterment. Numerous other particulars, to the point, might be mentioned; but as they are all very well known, there is no occasion for me to pass beyond an allusion to them. But I may be permitted to offer a comment. The circumstances of the case of Mr. Thompson shew what oral tradition might do for history if only the narrators proved to be persons of irreproachable integrity, good judgment, of cultivated minds, and active mental and bodily qualities, with the additional important advantage of having passed long lives amidst scenes calculated to perpetually freshen their memories and to remind them continually of even the minor incidents concerned.

In closing this portion of my subject, I cannot forbear referring to a somewhat remarkable instance of traditionary calumny and misapprehension being completely refuted by means of a recourse to official documentary evidence. At the siege of Quebec, in 1759, an officer named Montgomery was concerned in certain proceedings held to be, even in time of war, inexcusable, on account of their atrocity. As a consequence, his name and the memory of the man became odious. During a long period of time subsequently, it was generally supposed that Richard Montgomery, who fell, as has been stated already, at the assault of the city on the morning of January 1st, 1776, was that same officer. Nevertheless, that was not the universal conviction. A

gentleman, resident in Upper Canada, addressed an application to the War-office in England, in order to ascertain, if possible, what regiments were serving in America in 1759, their stations, and whether a Capt. Richard Montgomery had been one of the officers among those on duty at Quebec. The result was a search among the Archives of the War-office, and, in due time, an official reply to the application that had been sent from Canada. This shewed that there were, in that year, two officers named Montgomery serving with their regiments in America, of whom the one named Richard Mongtomery belonged to a regiment then with General Amherst's forces at Lake Champlain. The other Montgomery—whether or not a brother of Richard, as some have supposed, is uncertain—was at the same time serving in one of the regiments under Wolfe, at Quebec. It was further stated, in the official reply, that the said Richard Montgomery, some years afterwards, while his regiment was still in America, but before the commencement of the revolutionary war in 1775, sold his commission and retired from the service. In short, the Richard Montgomery who thus retired from the British army, and who settled down in America, transferring his allegiance to the United States, and who afterwards perished at Quebec, in 1776, was not the man whose name and memory merited those odious imputations; but, under a misapprehension of the real facts, he had been mistaken for another officer whose sirname was the same as his. I think it right to mention that a copy of the letter intimating these facts was communicated to me by one of the vice-presidents, Mr. LeMoine, of whom I suspected at the time, and have done so ever since, that he had himself been mainly instrumental in thus rescuing the character of an innocent man from the odium so long resting upon his memory.

IV.—A complete collection of the Canadian Archi would embrace an enormous quantity of records scattered in localities very distant from each other, a

which many, perhaps the most valuable, are not the property of the Province. To obtain access to them, it would be necessary to go to the capitals of several of the neighbouring States, especially to Albany, Boston, Philadelphia, and Washington. We should be obliged to go to Halifax, to the British Museum and depositories of Archives at London, and to Paris.

To the methods of dealing with the public records in some of those places, I shall have occasion to refer. As regards the documents themselves, however, their nature and contents, my observations will be confined as much as possible to Archives actually held in the Province and belonging to it. But, in truth, owing to various causes, and, amongst these, to the former migratory character of our Governments and Parliaments, and, partly, to the recent establishment of the Constitution of the Dominion, it is yet impossible to pronounce what we really have in the shape of Archives, or to point out precisely the localities in which they are lodged. Besides those to be found at the several existing seats of Government, there is a very considerable mass of them at Montreal, and, probably, some remaining at Kingston.

With respect to the Archives of the Colony, of periods antecedent to the year 1764, we may infer some particulars of their nature, and how they were disposed of, by consulting the Articles of Capitulation, dated Sept. 8th, 1760. In seven or eight of these, we find stipulations proposed by De Vaudreuil in behalf of what are concisely styled "papers." De Vaudreuil demands that those in his own possession and that of General de Lévis and Intendant Bigot, as also the Colonial Government papers and those belonging to the several public departments, shall be transported to France, without previous inspection by British officers, under any pretext whatever. In article 45, it is stipulated, on the contrary, that certain documents shall be suffered to remain

behind in the offices where they had been customarily kept —these documents being the Registers and papers of the Supreme Council; those of the Provost and Marine Office at Quebec; those belonging to the Royal Jurisdictions of Three Rivers and Montreal; the Seigniorial papers; the Notarial Deeds lodged in the towns and villages; and, generally, all Records concerning the estates and property of individuals. Amherst grants the stipulation of article 45, in full. The other stipulations about the papers of De Vaudreuil and the chief officers he also agrees to, with two reservations—namely: 1st, that all Archives necessary for conducting the government of the country be excepted; and 2nd, that the Marquis de Vaudreuil and all officers, of whatever rank, hand over to the British authorities, in good faith, all plans and maps of the country.

From these particulars we may infer that a large number of Archives must have been removed from the colony to France on the departure of the last French governor with his officers and troops, in the autumn of 1760, but that a very large quantity must have remained behind. However important it might seem to obtain detailed information of all the ancient Records included in General Amherst's exceptions, it is matter of doubt whether any official or other person in this country is at present in a position to furnish it. But we cannot say the same of the Archives of the Supreme Council or some other public Records mentioned in No. 45 of the Articles of Capitulation. In the years 1854 and 1855, three valuable sets were printed and published at the public expense, consisting of the Royal Edicts and Ordinances concerning Canada from 1627 to 1756, the enactments of the Supreme Council since its establishment in 1663, and the Ordinances and Judgments of the Royal Intendants of Canada from 1663 to 1758. We have, besides, in printed form, probably all that the most zealous Archæologist would now care to study on the subject of the Seigniorial Tenure, a result for which I believe the public is

indebted to the laborious researches and professional ability of the honorable gentleman who acted as counsel for the Seigneurs before the tribunal which adjudicated on their claims.

It would take us into too wearisome details to discuss further, or in any manner commensurate with its importance, the subject of the old Archives of Canada—that is, those which relate to its affairs prior to the capitulation in 1760. Most of the original documents left behind in the country in that year, are, I believe, in the custody of one of the Departments of State at Ottawa. I further believe that in the prosecution of its legitimate functions, this Society would do well to renew its inquiries into this matter, with a view to obtaining certain and complete information on all points appertaining to it.

Of the Canadian Archives relating to affairs of dates subsequent to that of the cession of the Colony to England, and extending to the epoch of Confederation, I consider it safe to say that they are in a position even less accessible than the Records of anterior periods. It is probable the ancient French public papers which may remain in the country would be found to be so far sorted and properly labelled as to require no very large amount of expense and labour in procuring catalogues of them. We cannot, however, say this of the later Archives. It has been already stated that a considerable mass of them is lodged at Montreal—some, but I believe no considerable portion of the whole, being sorted, put in bundles, and labelled, though there is reason for doubting whether the terms of endorsation on each packet are suitable for all the papers within. Those which are sorted and labelled bear dates beginning with the year 1764. In some of the upper shelves and partitions, bundles of documents and loose papers are to be seen unsorted; and it is impossible, without examination, to pronounce upon the nature of their contents, or whether, as regards their dates, they correspond with the labelled

documents nearest to them. In other receptacles and places, on shelves, tables, and in large boxes or cases, are multitudes of documents, papers, engrossed sheets, petitions, addresses, printed leaves and books, and some bound volumes of manuscript. An inspection of some of these latter gives the impression that their statistical and other contents are of considerable value, and that they are well worthy of being catalogued, with a summary of their nature, if not to be printed in full. What the contents of several large cases may be must remain matter of conjecture until they are opened, and the documents within examined and sorted. On taking up a loose sheet in the upper part of an open case, it was seen to be an engrossed copy of an address, prepared, I believe, at Three Rivers, in the year 1787. In the same case were many other papers, some in the form of rolls, others written on foolscap, which from their appearance were judged to appertain to a variety of subjects and dates. The whole of the matters which I have thus summarily adverted to are contained in vaults underneath the old Government House at Montreal. I was informed by the worthy keeper, Mr. David Luck,—who has been in attendance there upon Governors and Cabinet Ministers, and in charge of Records, since the days of Sir George Prevost, and who, I was gratified to learn, has just been handsomely pensioned off by the Dominion Government,—that the vaults were usually musty and damp, and scarcely safe for the purposes of search, without the use of a stove. I gathered, in fact, from his remarks, that at least two persons had accelerated their premature decease by too assiduously prosecuting there the work of searching for documents and sorting old papers. Considering the risks of fire, and the probability of an irreparable loss, which the members of this Society are well able to appreciate, the circumstances I have mentioned will not seem to be unworthy of their notice. Upon the whole, and in the interest of literature and the history of our country, as well as for other reasons not necessary to be stated on this occasion, I cannot forbear expressing my conviction of

the advantages that would be secured if it should be found practicable to turn to account the organization of the Society in regard to these Archives.

V.—I had intended to close my present paper with some remarks which I thought might prove indirectly useful in our own case, or, at least, not likely to prove unacceptable, in relation to modes of dealing with Archives elsewhere; but the length to which the foregoing have extended reminds me that I must now do this far more briefly than I could desire if time permitted.

(1.)—The regular fyling away of official documents received and of copies of official correspondence, as practised in all our public departments, followed by the publication of annual reports, leads to the rapid accumulation of public records, of the nature of Archives. These, together with the Bills, Acts, and Returns to Parliamentary Addresses, amount, in the course of every few years, to an unmanageable mass of documents, unless there be at the same time a convenient system providing for their safe custody, and facilities of access to them for search and for future reference.

(2.)—I have understood that the means of attaining these objects in France are as perfect as they could be expected under a *quasi*-despotic form of government. This Society has already profited by those opportunities, so as to find and obtain copies of many valuable papers amongst the French Archives relating to the early History of Canada. Not being sufficiently familiar with the details, I will not occupy time with further allusion to the French system.

(3.)—In England, the Public Records were formerly dispersed in upwards of sixty different places. Within a few years past, a vast building has been erected in London for the reception of them all. It contains more than two hundred distinct apartments, affording space for more than

half a million cubic feet of documents, and accommodation not merely for existing records, but also for all that are expected to accrue in the course of the next half-century. The building is fire-proof throughout, and the whole under the charge of an official styled "Master of the Rolls." He receives from the various Departments of State, the Parliament, Courts of Common Law, of Chancery, the Admiralty, and many others, Records above twenty years old. All are catalogued for convenience of reference, and any person may make a search and copy extracts on payment of a small fee; but a *bonâ-fide literary* inquirer can obtain searches and copies of documents in pencil without any charge, provided he can satisfy the deputy-keeper that his purpose is really of a literary nature. The extent to which this privilege is appreciated by literary persons is wonderful, it being not uncommon for a single individual to consult four or five thousand documents within one year. Such is the excellence of the arrangements, that only a very few minutes elapse before an applicant's demand is complied with, whatever be the nature and date of the document required.

There is also in London a distinct establishment for preserving Wills, called Doctors' Commons. The original wills are required to be deposited here before they can be legally administered to by executors. These date from the year 1483 down to the present time; but there are copies of still older instruments beginning with 1383. Any person, for a small fee, may procure the perusal of a will, the search for it being completed at half an hour's notice—usually within a few minutes. A longer notice is necessary when a copy is required. In a year, the number of searches approaches to 30,000, and applications for copies and extracts to nearly 10,000 more. The structure is fire-proof, and the arrangements such as always to secure perfect copies.

The facts here stated will suffice to shew that the public records in England are made strictly public property, and

that most efficient systems have been adopted for securing safe custody as well as all necessary facilities for search and reference. Yet, an authority already cited says: "The Records of this country have no equal in the civilized world, in antiquity, continuity, variety, extent, or amplitude of facts and details. From *Domes-day* they contain the whole materials for our history—civil, religious, political, social, moral or material, from the Norman conquest to the present day."

(4.)—In the United States, the public records of the several States of the Union are placed in charge of the State Librarians, who are liberally compensated. The documents, as they accumulate from year to year, are suitably numbered and placed, so as to be convenient for future access and reference. A catalogue of them is printed annually. Any person, on application, can obtain access to them, whether for perusal or copying. There is no charge for making a search. In the separate States there are no distinct collections of departmental Archives, for the public documents of every department are handed over to the custody of the State Librarians. In Washington, each department keeps its own records, while those appertaining to the whole United States are placed in the custody of officials acting under the authority of the President himself. The arrangements for security and for convenient reference are stated to be of a very perfect nature; but no national document relating to the whole of the States can be procured for the purpose of perusal or copying without the President's order.

(5.)—In Nova Scotia, action was taken in 1857, with a view to ascertaining the nature and contents of the Archives of that Province. The Hon. Jos. Howe moved for an address to the Governor, "to cause the ancient records and "documents illustrative of the history and progress of society "in the Province to be examined, preserved and arranged, "for reference or publication, as the Legislature might

"determine, and that the House would provide for the "same." In 1858 and the following year, further steps were taken to procure from England and from Canada copies of any despatches that might be needed for completing the Nova Scotian fyles. In the course of subsequent years, more than 200 volumes of manuscripts were selected, arranged, catalogued, and bound.

The next step was to authorize the preparation and publication of a volume containing selections of such of the Archives as should be deemed to possess the greatest historical value. Last year, under the auspices of the Commissioner of the Nova Scotian Public Records, the volume, consisting of 755 pages, was brought out.

The work is of a truly interesting character. Its contents cover the period from 1714 to 1760, divided into five principal portions, with an elaborate index. I will not undertake to describe it; nor would this be necessary, for, through the good offices of the President of this Society, who, I understand, is an intimate friend of the compiler of the work, members are enabled to judge for themselves, since copies of it are to be found on the shelves of the Library.

It only remains for me to crave indulgence for the imperfections of this paper, which, owing to unavoidable circumstances, was prepared with more haste than the importance of its subject would appear to warrant.

Paper IV.—EDUCATION—PRACTICAL AND NATIONAL.

By the Reverend J. H. JOHNSON, M.A.

(Read before the Society, Feb. 15th, 1871.)

As a Canadian, I desire to see a nationality for Canada. I would have all who reside here, intending to make this their home, as well as all who, like myself, have had their birth on Canadian soil, remember that Canada is even now a *country;* that she has in her bosom all the elements of future greatness; and if her sons and her daughters fully realize their position, and prove true to the indications of Providence, she may not only stand high amongst the nations, but she may yet become the founder of empires, and give laws to other countries. By a Canadian education, I mean an education adapted to the circumstances and wants of the people of Canada, an education which will fit young people to discharge those duties, and assume those responsibilities, which sooner or later must devolve upon them as the citizens of a new and growing country. While great attention should be paid to the classics and the natural sciences, as well as the higher mathematics, by those whose pursuits will require attainment in these departments of study, there should be a universal regard to those branches of knowledge that are considered inferior, but which qualify the majority for the practical business of their lives. Besides this, education should be ornamental as well as solid. A writer said in *The Spectator*, more than a century ago:—"The general mistake among us in educating our children is, that in our daughters, we take care of their persons, and neglect their minds; in our sons, we are so intent upon adorning their minds, that we wholly neglect their bodies. It is from this that you shall see a young lady celebrated and admired in all the assemblies about town, when her

elder brother is afraid to come into a room. From this ill-management it arises, that we frequently observe a man's life is half spent, before he is taken notice of, and a woman in the prime of her years is out of fashion and neglected. The true art in this case is, to make the mind and body improve together."

Education commences in a very early period of life. Man is possessed of faculties, by the development of which, he takes his place in the highest scale of created beings, and finds himself surrounded by objects, and in the midst of scenes adapted to the growth of these faculties. Every influence brought to bear upon him, will tend to educate either the good or the bad principles of his nature. So that, both intellectually and morally, he is undergoing a process of development. Especially is this the case with youth.

> "'Tis education forms the common mind;
> Just as the twig is bent, the tree's inclined."

The word "*educate*" is thus defined by an eminent lexicographer: "To bring up as a child; to instruct; to inform and enlighten the understanding; to instill into the mind principles of arts, science, morals, religion, and behaviour." But a reference to the original may give its meaning more fully. The Latin "*educo*," from "*duco*," I lead, and "*e*," "out of," when applied to a human being, signifies the *drawing out* of his faculties. The illustration of Addison has always been admired. He compares a human soul without education to a statue in a block of marble. The statue exists in the marble, and the sculptor only finds it. So education removes the rubbish, and the man appears.

The subject of education naturally divides itself into three branches—*physical*, *intellectual*, and *moral*.

First, then, education should be *physical*. This relates to the inferior part of our nature; but it has strong claims upon

our attention. The mind is necessarily affected by the condition of the body. It acts through the physical organs. If these be disordered, the powers of the soul will be obstructed in their operations. All people, the young especially, should exercise freely, and at stated periods, in the open air. Close confinement has involved many in physical debility, and left them to drag out a life-time of suffering. Some of the most eminent physiologists and enlightened educators, have turned their attention to this subject, and fearful is the picture of woe they have presented to the public. Every institution of learning, from the elementary school up to the university, should have its ample play-grounds, with proper facilities for physical exercise. The hours, both of study and recreation, should then be so arranged, as not to infringe upon those portions of time essential to the preservation of the health of students. There should be a suitable proportion between the development of the physical, and that of the intellectual faculties. If this proportion be destroyed, both natures will suffer. Many have fallen through an incessant application to study, whom a moderate attention to gymnastic exercises might have preserved for extensive usefulness. The laws of nature cannot be violated with impunity. Here every transgressor must pay the penalty. Those who are too ambitious to ascend the hill of science, and are desirous of employing every moment of their time, may be compelled by their impatience and indiscretion, to make a long halt by the way, suspending their energies, and often failing to realize their hopes. And many, even after attaining to eminence in letters, have so abused their physical nature by the process, that they have not been able to use the knowledge they had acquired.

We come now to the *intellectual* branch of education. The importance of this cannot be over-estimated. "The intellectual powers are those by which man acquires the knowledge of facts, observes their connexions, and traces the conclusions which arise out of them." Much might be said on this

interesting subject; but I shall only speak of education, as calculated to discipline the mind and fit a man for usefulness in life. In order to this, a judicious selection of studies should be made by each student, and pursued in that connexion which will tend to develope all the faculties of the mind alike. There is in most minds a predilection for some particular study, or a preference for those pursuits which will serve to call into exercise some special faculty, to the neglect of the rest. This is commonly observed in the industrial pursuits, where it appears to be perfectly in place; but every student should guard against its indulgence in a system of education. Not that any young person should be prevented from fitting himself for that business in life which his inclination leads him to pursue, and which his parents or guardians may have selected for him, by giving more immediate attention to those branches of science required for such avocation; but in order to preserve a well-balanced mind, the study of those branches which call out and give vigor to various faculties, is an indispensable requisite.

Remember also, that *thoroughness* is essential to a good intellectual education. In fact, there can be no mental discipline, or real improvement, without it. Whatever is attempted, should be accomplished, and nothing is learned until it is understood. The system of committing to memory, without digesting the writings of an author, so prevalent in our day, cannot be called education.

We must bear in mind also, that it is not possible to acquire a knowledge of every thing, whatever may be a man's intellectual powers, and whatever his facilities for improving them. That profound scholar, Boyle, tells us of a certain mineral that a man may occupy his whole life in studying, without arriving at a knowledge of all its qualities. And the truth is, "there is not a single science, or any branch of it, that might not furnish a man with business for life, though life were much longer than it is." No man, then, should

suffer himself to be inflated with the idea that he has become a scholar or a learned man, because he has attended school, or spent a few months in the pursuit of any science.

> "A little learning is a dangerous thing—
> Drink deep, or taste not the Pierian spring.
> There shallow draughts intoxicate the brain;
> But drinking largely sobers us again."

The more extensive our attainments, the more deeply we shall be impressed with our lack of knowledge. The great Sir Isaac Newton, after all his researches, and all his attainments, compared himself, in point of knowledge, with a man who had approached the ocean, and gathered a few pebbles upon its shore, while the mighty deep, with its teeming millions of inhabitants, its inexhaustible treasures, and its innumerable islands of verdure and beauty, lay unexplored before him.

Lord Bacon said: "Knowledge is power." And it is certainly knowledge that rules the world. Nor is it too much to say, that, in a new country like ours, where there are so many openings to the aspirations of youth, success will materially depend on the zeal and energy with which they devote themselves to study, and the supply of those intellectual treasures which they shall lay up for future use. On some of the personal advantages of an education to those who are so fortunate as to acquire it, the following remarks are from one of the best writers in the English language:—"The hours of a wise man are lengthened by his ideas, as those of a fool are by his passions. The time of the latter is long, because he does not know what to do with it; so is that of the former, because he distinguishes every moment of it with useful or amusing thoughts; or, in other words, because the one is always wishing it away, and the other always enjoying it. How different is the view of past life, in the man who is grown old in knowledge and wisdom, from that of him who is grown old in ignorance and folly! The latter is like the owner of a barren country, that fills his

eye with the prospect of naked hills and plains, which produce nothing either profitable or ornamental; the former beholds a beautiful and spacious landscape divided into delightful gardens, green meadows, fruitful fields, and can scarce cast his eye on a single spot of his possessions that is not covered with some beautiful plant or flower."

But in addition to the physical and intellectual, we must mention *moral* education. Unless based on sound moral principles, the two former will prove a curse rather than a blessing to society, and cannot much further the real interests of those that have acquired them. This sentiment cannot be too firmly impressed upon the mind. Young people, and after them, those of mature years, are too apt to be dazzled by appearances. But the intellectually great are not always to be admired. There is great force in the following lines from Pope:

> "If parts allure thee, think how Bacon shined—
> The wisest, brightest, meanest of mankind;
> Or, ravish'd with the whistling of a name,
> See Cromwell damn'd to everlasting fame!
> If all, united, thy ambition call,
> From ancient story, learn to scorn them all."
> * * * * * * * *
> In each how guilt and greatness equal ran,
> And all that rais'd the hero, sunk the man!
> * * * * * * * * *
> The whole amount of their enormous fame,
> A tale that blends their sorrow with their shame."

Man has an elevated nature. He is a moral being. In this department we reckon the desires, the affections, self-love, the will, conscience, and the moral relation of man towards the Deity. Every system of education must be considered defective which omits the proper cultivation of these principles. On this analysis of man as a moral being, much might be said. It would be easy to show the necessity of controlling the desires, of placing the affections upon suitable objects, of confining self-love within reasonable

bounds, of regulating the will by correct principles, and of listening to the admonitions of an enlightened conscience. These are all involved in a sound system of moral education. And to these must be added man's relation to his Maker. Indeed, on his attention to this particular will materially depend the advantage to which his intellectual attainments may be applied. The late Dr. Thomas Arnold, of Rugby, who was one of the most successful teachers of modern times, kept prominently before his pupils the great fact of their responsibility to God. His biographer says of him, that "he did not attempt merely to give theological instruction, or to introduce sacred words into school admonitions: his design arose out of the very nature of his office; the relation of an instructor to his pupils was to him, like all other relations of human life, only in a healthy state, when subordinate to their common relation to God. The idea of a Christian school was to him the natural result of the very idea of a school in itself. The intellectual training was not for a moment underrated, and the machinery of the school was left to have its own way. But he looked on the whole as bearing on the advancement of the one end of all instruction and education; the boys were still treated as school boys, but as school boys who must grow up to be Christian men; whose age did not prevent their faults from being sins, or their excellencies from being noble and Christian virtues; whose situation did not of itself make the application of Christian principles to their daily lives an impracticable vision." The eloquent and erudite Dr. Harris has very forcibly presented the value of revealed truth in awakening the energies of the human mind, and calling into exercise all its faculties in the acquisition of knowledge. He says:—"Let the Gospel obtain admission into the mind, and from that moment the most torpid specimen of humanity is quickened into a new mental as well as moral life. Even the mind which was previously alive and vigorous, becomes conscious of a new impulse to activity, and of a new sphere in which to spend it. In finding a

God, man finds the centre of all things, and henceforth the tendency of his mind is ever to harmonize the discordant, to arrange the displaced, and to assign to everything its right position in the great circle which surrounds the Deity. In finding 'the truth,' he finds an infallible standard by which everything is to be tested; henceforth he would fain try every pretension, weigh every claim, by its relation to this standard, and estimate everything accordingly. Unless, therefore, you do violence to the mind, and repress its activity, moral education to some extent becomes a necessity."

"The man who lives under an habitual sense of his moral responsibilities," says Addison, "no sooner steps aside from the busy scenes of life, than his heart burns with devotion, swells with hope, and triumphs in the consciousness of that presence which everywhere surrounds him; or, on the contrary, pours out its fears, its sorrows, its apprehensions, to the Great Supporter of his existence."

By the great principle of religion, do not understand that I recommend any system of denominationalism. True religion rises far above the region of party, and ignoring sects and contentions, teaches the truths of God, points out human duty, and breathes good-will to man. Passing by, therefore, the distinctive peculiarities of any and all religious communities, I maintain that the great fundamental doctrines of Christianity, held by all, should be assiduously instilled into the minds of the young.

Let me add to these three departments of education, a few observations on the importance of a proper cultivation of the manners. A certain amount of politeness in their intercourse with others, of whatever rank or position in society, should characterize all persons. By politeness, I do not mean the vain pageantry of the conceited coxcomb, or the supercilious deportment of the haughty aristocrat, but that essential ingredient in all good breeding which leads us to pay a

proper deference to the opinions of others, and to treat the persons and presence of all with that consideration due to their respective positions in society; a course of conduct equally removed from vanity on the one hand, and from coarseness and vulgarity on the other. No one who has not duly considered this subject, can fully appreciate its importance. Lord Chesterfield and others, who have written so much on the value of good manners, have rendered an essential service to society. Many persons of a high order of natural abilities, by coarseness of manners have rendered themselves obnoxious to refined society, and thus presented an insuperable barrier to their usefulness, and often to their success. Like the *erinaceous quadruped*, they cannot be approached from any direction without throwing at the unlucky but innocent one who approaches them the pointed missives of their own disagreeable natures. Men of good taste will avoid such, as they will the pestilence or a beast of prey.

The above is a mere outline of the education which ought to be not only general, but universal. Now, I hold that it is the prerogative of the constituted authorities to afford all reasonable facilities for the education of the people, not merely for a section or class, but for the whole. The government of a country exists for the protection of a country, and to promote the welfare of its inhabitants. The want of education is a serious drawback to the prosperity and happiness of a people, while its possession must be the means of material improvement and of comfort. The condition of the uneducated classes has been graphically described by Dr. Foster in his excellent Essay on the Evils of Popular Ignorance.

"Imagine," says he, "a week, month, or year of the intercourse of the members of a family destitute of mental culture, the course of talk, the mutual manners, and the progress of mind and character; where there is a sense of drudgery approaching to that of slavery, in the unrelenting

necessity of labor, where there is none of the interest of imparting knowledge or receiving it, or of reciprocating knowledge that has been imparted and received; where there is not an acre, if we might so express it, of intellectual space around them, clear of the thick universal fog of ignorance, where especially the luminaries of the spiritual heaven, the attributes of the Almighty, the grand phenomenon of redeeming mediation, the solemn realities of a future state and another world, are totally obscured in that shade; where the conscience and the discriminations of duty are dull and indistinct, from the youngest to the oldest; where there is no genuine respect felt or shown on the one side, nor affection unmixed with vulgar petulance and harshness on the other; and where a mutual coarseness of manners has the effect, without their being aware of it as a cause, of debasing their worth in one another's esteem all around. Home has but little to please the young members of such a family, while the elder ones have little enjoyment in their society. So little is the feeling of a peaceful cordiality created among them by their seeing one another all within the habitation, that, not unfrequently the passer-by may learn the fact of their collective number being there, from the sound of a low strife of mingled voices, some of them betraying youth replying in anger or contempt, to maturity or age. It is melancholy to see how early this liberty is boldly taken. As the children perceive nothing in the *minds* of their parents that should awe them into deference, the most important difference left between them is that of physical strength."

This is a dark picture; but it is not overdrawn. Ample materials for the composition of it may be found in this Province, in many places, and in this city. Ignorance has stamped her deformed image upon many families, and among them some afford scenes similar to those above described. Who can travel through some of the rural parts of this country, and especially pass through some of the inferior streets of our city, and not have his eyes and ears

pained with the evidences of social wretchedness that meet him? I refer not to the wretchedness arising from a want of pecuniary resources. This is abundant, no doubt; but from a paucity of intellectual gratifications—for mental poverty is the most despicable of all pauperism.

Now, I repeat that it is the duty of the State, as the protector of the people, to make provision for their education. Certainly, to furnish all with the means of obtaining a good elementary education, and to encourage and foster institutions for higher education where individual efforts may originate them. This proposition appears to me so obvious, that it requires no discussion. It is not only founded in reason, but the experience of all countries shows that neither voluntary effort nor religious association can render education universal, or even general; and that governmental interference is indispensable, alike to secure universality and uniformity. In our country the principle is admitted, and the annual legislative appropriations for educational purposes testify to the great prominence given this subject.

But after all the efforts made in this Province, now for nearly a generation, I apprehend that two facts must strike every careful observer, as indisputable, viz.: 1st, that a limited number of children attend school at all; and 2nd, that the education imparted is not, generally speaking, of that thorough or that comprehensive character which should distinguish a national system of education. The answer to this two-fold objection may seem to be very easy. To make a system comprehensive, provide an ample curriculum or course of study, and to ensure thoroughness, secure the best text-books and the most competent teachers. But how are these to be obtained? and how shall we make sure that ample school accommodation, with maps and apparatus, will be provided?—and then, most difficult of all, that the whole school population of the country can be got to attend? These are the questions to be answered; and when the difficulties

they suggest have been surmounted, all the advantages of a sound national education will inevitably follow.

First of all, I maintain that a national system of education should be free from sectarianism. Where children belong to parents of a different religious belief, it is manifestly inconsistent to teach either one or several religious creeds in our public schools. This inconsistency has been recognized, and the difficulty attempted to be met by the establishment of separate or dissentient schools for the minority. Such provision is doubtless a relief for the minority, and becomes an actual necessity, where the public schools are conducted upon a denominational principle. But why should they be? Is it necessary to interweave the catechism with reading, writing, geography, and arithmetic? Can neither grammar, algebra, nor geometry be safely learned, except through a sectarian medium? I can understand, that, both in school and elsewhere, moral and religious principles should be recognized and inculcated; but I do not see that any religious opinions should require to be inculcated in connexion with purely secular branches, any more than that they should be taught in our counting-rooms, or our manufactories, or our machine-shops, or even in the places set apart for our most menial labour. Why not leave the teaching of peculiar religious tenets to the parents and the church, to be carried out in the family circle and the Sabbath-School, or any other place belonging to the parents or the religious community? I would like to see our common schools attended by all classes alike; while protected by a wholesome moral influence, all the children of the land, together in their several localities, acquiring an education in those branches of science which will fit them for usefulness and enjoyment. And if parents and religious teachers do their duty, I cannot understand how the religious principles of children should be compromised by this course, or suffer from the absence of sectarian teaching at the public schools.

Having secured the establishment of our public schools on a broad and liberal basis, I would render them free to all the children of school-going age in the community. Rate-bills should be abolished, and no man's expenses for maintaining the cause of elementary education in the country should be increased by reason of his availing himself of the advantages of such an education for his children. On the contrary, this should be his and their *right*. How, then, should public schools be supported? I answer, partly by an appropriation from the revenues of the country, and the balance by a direct tax upon the rateable property of the school district.

To this it may be objected, that the Legislature, in setting apart a certain fund for Common School purposes, and allowing the imposition of a tax in localities to a limited amount, ought to go no further; and it may be thought unjust to compel any man to assist in gratuitously educating his neighbour's children. I reply, this argument, if it proves anything, proves too much. It is either just to provide for *all* the expenses of public schools by taxation, or it is not just to provide for *any* of them by such means. If it is right to take *a cent* for this object, it is equally right to take *a dollar*, or as much as may be necessary to accomplish the purpose.

I employ the term "taxation" as applicable alike to what is called "government allowance" and what is raised from the people by an assessment upon their property. The revenues of any free country belong to the people of that country. True, an appropriation from these revenues is not so immediately felt as that raised by direct taxation. For this reason, I would be glad if, by economy in the administration of public affairs, by a retrenchment of other expenditures, and by any reasonable increase in the public revenues, enough could be afforded to establish a free school in every school district in the Province. But if this cannot be done, let the deficiency be made up by a direct tax upon property.

Even in a pecuniary point of view, the wealthy would find the free school system advantageous to themselves. Is not any kind of property enhanced in value by being situated in the midst of an intelligent, virtuous people? Is not real estate, as well as personal property, thus rendered more secure? Is not greater stability thereby given to our civil and social institutions? Are not the expenses of the administration of justice thereby greatly diminished? Who are they that crowd our prisons and our Penitentiary, that multiply the number of our lawyers, bailiffs, constables, jailors, judges, and sheriffs? Are they not usually those who have been brought up in ignorance of all that refines and ennobles the human mind? who have been educated in vice, because virtue had not been presented to them, and the activity of their minds required some outlet? The following remarks, from the speech of the chairman of a public meeting held in Manchester, England, are pertinent to my argument:—"I maintain, gentlemen, that the ratio of crime is directly inversely proportioned to the amount of education. It may be argued that people in superior circumstances, generally have a superior education, and are not exposed to the same temptations that those occupying a lower class are. I grant that to some extent this is true; but not by any means to the extent they go, when they seek to draw any important conclusions from it. From the returns I have given you, it will be seen that only one out of 150,000 of the population has been committed for crimes. I could show you, that out of 8,000,000 of adult females in this country, a whole year has passed without a single educated female being committed for trial for any offence whatever. But there are in London, as you well know, a number of well-educated—I'll call them gentlemen, or educated men, if you please—who have to struggle day by day, and hour by hour, against an amount of privation which, in my humble judgment, few people in this part of the country understand. You shall take your actors, your authors, your artists, your men connected with various learned professions, your teachers, your decayed

females, and others, of whom the mass in London is enormous, and I will show you that in one year, whilst there were fifteen hundred uneducated people committed to prison in Lancashire, in the county of Middlesex, in which London is situated, not one educated person was committed to prison for any offence whatever."

Doubtless, correct statistics in the Province of Quebec, would support the same theory. What an amount of crime, and consequent misery to society, might be saved, by teaching youth some mode of employing their time profitably, impressing upon them noble principles of thought and action, developing their powers, intellectual and physical, and directing them into proper channels! We have a House of Correction for juvenile offenders. Would it not be well to have, not one house for the whole Province, but one for every section, in the shape of a free school, to prevent juveniles from *offending*? The reformation of criminals is acknowledged to be a difficult, and in many instances, a hopeless task. But here is a plan to control the stream, by beginning at the fountain. Without, however, claiming every thing for education, we can safely assign it an important position in forming the human character upon a correct basis.

But it may be said, that, after all the facilities proposed are provided, multitudes of the lower classes are too indigent to furnish their children with books and clothes ; or they so little value an education, that they will not afford them the necessary time to attend school. For the former I would make a special provision, similar to the arrangement in the English ragged schools, the pupils being furnished with suitable garments and books, not to be removed from the school room. And in the latter case, I would make it obligatory upon the parent to send his children to school.

In short, I warmly recommend the compulsory system of education, and have done so since 1850, when I advocated

it at a Convention in Upper Canada. I propose to abolish all rate-bills, and introduce the free school system in all its departments. In addition to this, I would fine the parent or guardian of each child, between 5 and 16 years of age, who is not attending some school, private or public, or being otherwise properly educated; and if *fining* did not answer the purpose, I would *confine* the parent or guardian, for a limited period, with a view to secure the facility of education to the child. I believe no School Law can be complete without such a provision. In the case of a breach of the peace, under our laws, the person offending, if found guilty, is compelled to pay a fine, or undergo imprisonment, often at hard labor, for a stated period, according to the nature of the offence. In the plan which I propose, there is a more visible connexion between the crime and its punishment. In both cases the penalty carries with it a recognition of the principle, that every individual who inflicts an injury upon the community, shall repair the damage to the extent of his ability. But how slight an offence is his who assaults his fellow creature, compared with that of the man who helps to surround him with an ignorant, degraded society? Do we not need protection from such inhuman citizens? Does not ignorance occasion violence, theft, intemperance, robbery, and even murder? Many a man has been a pest to society, and ended his days on the gallows, whom the benign influences of a common school education might have made an ornament to his race. I grant, indeed, that there are melancholy instances of acquired abilities perverted, of even a Christian education becoming worse than useless, for man is naturally depraved, and only his Maker can constitute him anew; but such a system of education as I suggest, will do much to turn his energies into the proper channel, and keep him from mischief.

Imagine not that I attach too much importance to the education of the young. It is not easy to over-estimate it. Why has the Creator endowed us with faculties whose

development marks our character, and points us out as a blessing or a scourge to our fellows? Why has he decreed that knowledge shall expand the mind and exalt those faculties, while it refines the taste of pleasure, and opens up numerous sources of intellectual enjoyment? Why has he ordained that, in the intervals of physical repose (which all manual laborers absolutely require), the cultivation of the mental powers is not only conducive, but essential to health? "The Author of Nature," says the eloquent Robert Hall, "has wisely annexed a pleasure to the exercise of our active powers, especially to the pursuit of truth, which, if it be in some instances less intense, is far more durable than the gratifications of sense, and is on that account, to say nothing of its other properties, incomparably more valuable. It may be repeated without satiety, and pleases afresh at every reflection upon it. These are self-created satisfactions, always within our reach, not dependent upon events, and not requiring a peculiar combination of circumstances to produce or maintain them. Let the mind but retain its proper functions, and they spring up spontaneously, unsolicited, unborrowed, and unbought."

Entertaining such sentiments, I consider it the duty of all classes and all parties to combine, and provide such a system of national education, as shall necessarily embrace the entire community. I advocate the free school system, as calculated to effect this object, while at the same time it is just in principle. To the rate-bill I have two serious objections: 1st, that it has kept many of the poor class of children, as well as those of some selfish parents, not of the poor class, from school altogether; and 2ndly, that it makes the teacher servilely dependent on the patrons of the school. By the former objection, some of the most promising children have been practically excluded from our public schools. Their parents struggling under the oppressions of poverty, have found that, in addition to the clothing of a large family, they could ill spare the means to pay even the moderate

tuition fees demanded for their education. However anxious they may be to afford their offspring the facilities for mental improvement, their limited resources have put it out of their power to do so. Nor does it furnish a satisfactory answer to this objection, to say that the commissioners are authorized to send indigent children to school, making their instruction a charge upon the property-holding inhabitants of the school-district; for, with their utmost vigilance, commissioners, or trustees, may be deceived as to the resources of parents in some instances, and overlook them in others; besides, the honorable pride of many of the industrious poor will not permit their children to become pensioners upon public charity, and be subjected to the taunts of those in better circumstances, who will not fail to administer those taunts. But free schools, by bringing all upon a level, remove this objection. The children of the rich do not then have access to the school, because their parents have enough and to spare; nor those of the poor, because their neighbours are charitable and humane, and the Government is generous or bountiful; but both attend, because they are *children*, endowed with faculties of infinite worth, and because their education is a birthright, and must be obtained as a matter of course. Could public opinion be brought to this point in the Province of Quebec, we should see our public schools crowded with children, whose object would be, not to while away their time, but to store their minds with useful knowledge,—not to escape from parental restraint, but to mould and fashion their mental and moral character after the best models, and prepare themselves to act their part upon the great stage of life. But I am satisfied that nothing short of an universal, comprehensive free school system can place the children of this Province in such an honorable position.

And as to those parents who are able, but unwilling to send their children to school, the plan I suggest would most effectually meet their case. Nothing then could prevent

their children from enjoying the advantages of others; for if their parents are not open to mental persuasion or conviction of judgment, they would unquestionably be to fine and imprisonment.

The second objection to the rate-bill is, that it makes teachers dependent on the good opinion, and subject to the caprice of the parents of the children they teach. The more independent the teacher is of the parents, the better. The Commissioners are the proper parties to come in between the two in case of difference of opinion, or difficulty of any kind. Then as to a knowledge of a teacher's qualifications, the majority of parents are certainly not competent judges; yet they are continually interfering, where they are called upon to pay a school bill; for, as a great author remarks, "there is a very common infirmity of human nature, inclining us to be most curious and conceited in matters where we have least concern, and for which we are least adapted by study or nature."

Do not understand me, however, as prohibiting parents from taking an interest in the education of their children. Much of their children's success will depend upon that interest, and by judicious co-operation, they may greatly strengthen the teacher's hands; but let them beware of weakening his influence with their children.

Another phase in which this objectionable dependence displays itself, consists in making the amount of a teacher's wages depend on the number of children under his instruction. The agreement with teachers in this Province is, generally, to pay them the government grant for their section, and permit them to charge each pupil a certain sum per month or quarter. But a small portion of the teacher's salary can be considered as definite by this arrangement. The inducement to the teacher to accommodate himself to the prejudices of the people, is very strong; dissatisfied

parties will have it in their power materially to reduce his wages; and the interests of education may be greatly retarded. It is better, therefore, for all parties, for the teacher himself, for parents, for the Commissioners who have the supervision of the school, and for the children, that the teacher's income should be fully determined at the time of his engagement, which can generally be done only under the free system.

What I recommend is no novelty. The plan has been tried in other countries, and with all the results I have claimed for it. Several of the Northern States of America have had free schools in operation for many years. Those in the State of Massachusetts have secured general education, and have brought to the head of affairs some of the poorest children in the land. In the State of New York, the introduction of the free school system caused an accession of 100,000 children to the Common Schools of that State in a single year. In the Kingdom of Prussia both free schools and compulsory education have been in existence for about half a century. The effect has been universal intelligence, and as "knowledge is power," Prussia has developed a power which has no parallel in the history of modern nations, if indeed in the history of the world. During the wonderful campaign which has brought France so terribly under her power, even her common soldiers have evinced a knowledge which has fitted them for any position or emergency. In Sweden compulsory education has been the law for several years, and with the best results. In the neighboring Province of Ontario, for twenty-two years past the residents of each school section have been authorized by law to determine by a vote, at the beginning of each year, whether their school should be free. The principle so grew into favor, that all but a mere fraction of their schools have been free for several years past; and to that feature in her common schools Ontario has been much indebted for the excellent school system which has commanded the admiration of all who

have investigated it. And I am pleased to see that at the session of the Ontario Legislature held this winter, all the common schools of that Province are declared free, and education has been made compulsory. The result of these great measures to the sister Province, will unquestionably be the crowning of the great educational edifice, rendering the system complete, and securing the universal education of the succeeding generations. May the time be near when this Province shall imitate Ontario in her noble school system, and when education here shall be alike generally diffused.

To make free schools just in principle, however, besides being established upon such a basis as will render them generally acceptable, as I have already shown, two other conditions are necessary : viz., good school houses and good teachers. To tax all the property of a school section for the education of all the children in that section, when there is not ample accommodation for the school-going children, is evidently unjust. Large and commodious school rooms, made comfortable in their internal arrangements, should be provided in all parts of the land, and furnished with maps and apparatus, with all the improvements suggested by modern science. That we have such at present, is what, I presume, no advocate of our school system would claim.

Then, with respect to teachers, the most efficient possible should be procured, and that even at a large increase in expense. The practice of selecting school teachers on the ground of their cheapness, ought to be abandoned. But it has been carried to a great extent in some localities. An anecdote is related of a schoolmaster in a country which shall be nameless, who was employed in that capacity, for the very excellent reason that he had become too old and infirm to take care of a farmer's pigs, and he was appointed, as to a business next in importance, to take care of the children of the neighbourhood. Being interrogated by

a visitor as to what he taught them, he replied with perfect sincerity and composure, "Nothing." And to the question, "Why he taught them nothing?" he answered, with frankness and simplicity, "Because I know nothing myself."

The following from an American writer can scarcely be considered a caricature: "What motives are now most influential in prompting men to follow the business of common school-teaching? Some engage in this employment during the winter months, because they can make higher wages by it than by farming or mechanical labor. Some follow the profession of teaching, because they are too feeble to endure the more hardy and often more coveted toils of active out-door employment. Others again, because they have failed of success in all other pursuits. Others, for the more honorable purpose of aiding themselves in obtaining a liberal education. And the multitude are made up of thriftless adventurers of every grade, too lazy to work, too poor to live without it, and much more fit to be peddling wooden nutmegs, or making hickory hams, than to undertake the task of training the youth of a nation to the knowledge and love of their duties as citizens and men."

I am happy, however, to bear my testimony to the excellent and improving character of our common school teachers. We have those who make teaching a profession, and intend to follow it while they are able. They have done, and are doing a great work, in moulding the mental and moral character of human beings, and are really amongst the greatest benefactors to their race. Such men deserve every encouragement, and ought to be remunerated for their valuable services, far beyond what they have been accustomed to receive. Our Provincial Normal Schools are performing an excellent service for the country, by providing it with a superior class of teachers, and securing greater uniformity in the system of teaching.

I intended to make some observations on superior education; but having already extended this lecture beyond its original limits, I find myself compelled to omit this branch of the subject. Perhaps I cannot better conclude, than by presenting to you the following plea for Free Schools, from the pen of the poet Wordsworth, who thus vindicates the right of the poorest child in Great Britain, to be *free* from the dominion of ignorance:

"O for the coming of that glorious time,
When, prizing knowledge as her noblest wealth
And best protection, this imperial realm,
While she exacts allegiance, shall admit
An obligation on her part, to *teach*
Those who are born to serve her and obey;
Binding herself by statute to secure
For all the children whom her soil maintains
The rudiments of letters, and inform
The mind with moral and religious truth,
Both understood and practised,—so that none,
However destitute, be left to droop
By timely culture unsustained; or run
Into a wild disorder; or be forced
To drudge through weary life without the help
Of intellectual implements and tools;
A savage horde among the civilized,
A servile band among the lordly free!
This sacred right the lisping babe proclaims
To be inherent, by his Maker's will,
For the protection of his innocence:
And the rude boy—who, having overpast
The sinless age, by conscience is enrolled,
Yet mutinously knits his angry brow,
And lifts his wilful hand, on mischief bent,
Or turns the godlike faculty of speech
To impious use—by process indirect
Declares his due, while he makes known his need.

This sacred right is fruitlessly announced,
This universal plea in vain addressed,
To eyes and ears of parents who themselves
Did, in the time of their necessity,
Urge it in vain; and, therefore, like a prayer
That from the humblest floor ascends to Heaven,
It mounts to reach the State's parental ear;
Who, if indeed she own a mother's heart,
And be not most unfeelingly devoid
Of gratitude to Providence, will grant
Th' unquestionable good—which, as we, safe
From interference and external force,
May grant at leisure, without risk incurred,
That what in wisdom for herself she doth,
Others shall ne'er be able to undo."

Paper V.—THE RED RIVER EXPEDITION OF 1870.

By Lieut. H. S. H. RIDDELL, 60th Rifles.

(Read before the Society, March 15th, 1871.)

In the year 1869, it was finally settled that the country known as Prince Rupert's Land, with all the territorial rights of the Hudson's Bay Company, should be transferred to the Dominion of Canada, on payment of a sum of £300,000. Up to this time, the Hudson's Bay Company were the actual rulers of the colony, as they had power to monopolize the whole of the fur trade, fur being the only export from the country. Throughout the whole of the Settlement, the idea of this cession of their lands and rights caused much indignation; and in the autumn of the year 1869, the first symptoms of a rebellion were discovered. One of its principal promoters was a French-Canadian, of the name of Louis Riel. He is described as having been educated in Canada, and afterwards obtained a situation in St. Paul's, Minnesota, where he lived for some time. Having been dismissed from his situation, he returned to Fort Garry, and, towards the end of 1869, headed the first act of resistance to the new *régime*, by warning a government surveying-party out of the neighbourhood in which they were engaged.

He then organized a government of his own, assisted by another similarly-disposed person, named O'Donoghue, and enthroned himself in Fort Garry as president of the settlement. The Honourable William Macdougall, Minister of Public Works, was chosen by the Canadian Government as first governor of the new Province, and proceeded to Fort Garry to assume his duties. On his arrival at Pembina, a small village on the boundary of British and American

territory, he found that the insurgents were determined to prevent his entry into the settlement, and had an armed party stationed on the road between Pembina and Fort Garry for that purpose. Mr. McDougall was, therefore, unable to go further, and had to remain at Pembina for some months. In the meantime, Riel was having it all his own way: he secured all the arms and ammunition in possession of the Hudson's Bay Company, and served them out among his followers; he searched private houses, and possessed himself of anything that he thought might prove of use. Those of the inhabitants who did not feel inclined to take the oath of allegiance to him, were imprisoned by his orders; and a Canadian, of the name of Scott, who to the last maintained his refusal to take this oath, was condemned to be shot. A mock court-martial was assembled for his trial; and at the execution of the sentence of death, there was nobody in the settlement who had the courage to say a word against this informal murder.

These events determined the government upon sending an armed force to the Red River to restore order and maintain the Queen's supremacy; and money for that purpose was voted in Parliament at the same time that the bill for the transfer of the new province, called the Manitoba Bill, was introduced. The Imperial Government arranged to pay one-fourth of the expense of this expedition, and the Dominion of Canada was to pay the remainder.

The organization of the force was entrusted to Lieutenant-General Honble. James Lindsay, who had been sent out from England for that purpose, and who, a few years since, had been in command of one of the military districts in this country. Lately, he has held the position of Inspector-General of Reserve Forces in England. Colonel Wolseley, late Quarter-Master-General in Montreal, was appointed to command the expedition, which was composed of the following troops:

Royal Artillery:—19 non-commissioned officers and men, under Lieut. Alleyn;

Royal Engineers:—19 non-commissioned officers and men, under Lieut. Heneage;

1st Battalion 60th Rifles:—26 officers and 351 non-commissioned officers and men, under Colonel Feilden;

Army-Service Corps:—12 non-commissioned officers and men;

Army-Hospital Corps:—8 non-commissioned officers and men;

1st, or Ontario Battalion of Militia:—28 officers and 350 non-commissioned officers and men, under Lieut.-Colonel Jarvis;

2nd, or Quebec Battalion of Militia:—28 officers and 350 non-commissioned officers and men, under Lt.-Col. Casault;

Making a total of 84 regimental officers and 1109 non-commissioned officers and men.

The staff consisted of:

Colonel Wolseley, commanding;

Captain Huyshe, Rifle Brigade,
Lieut. Denison, Governor-General's Body-Guard, } Aides-de-Camp;

Lieut.-Colonel Bolton, Royal Artillery, Deputy-Assistant Adjutant-General;

Major M'Leod, Brigade-Major of Militia;

Lieut.-Colonel McNeill, V.C., attached to staff;

Surgeon-Major Young, M.D., 60th Rifles, Principal Medical Officer;

Staff-Assistant-Surgeons Shaw, Robertson, and Chatterton;

And the following officers of the Control Department:

Assistant-Controller Irvine;
Commissary Pennell;
" Mellish;
Deputy-Commissary Marston;
" " Meyer;
" " Beamish;
Assist.-Commissary Jolly.

Transport Service:

Captain Nagle, Captain Money, and Lieut. Smyth, late R. C. Rifles;

From the Militia, Capt. Peebles was attached as Deputy-Commissary.

Total, of all ranks, 1213.

The expedition was to start for Lake Superior as early as possible in the spring, and recruiting for the militia regiments was carried on rapidly. No lack of either officers or men was found; and had it been necessary to raise another entire battalion, it could in a very short time have been accomplished. The Crystal Palace, in Toronto, was converted into a barrack, and for some weeks was occupied by the militia battalions. The boats to be used (140 in number) were supplied by different boat-builders throughout the Dominion, who had been furnished with the size and description of the boats required by the agent of the Public Works Department. This department had also engaged to have a road cut through the forest, and ready to be used on our arrival, from Thunder Bay to Lake Shebandowan, a distance of 46 miles. The officers entrusted with the organization and command of the force had not travelled further on the route than Collingwood, and, therefore, were obliged to believe everything they were told about the road by Mr. Dawson, the government engineer.

Lieutenant-General Lindsay personally inspected the 60th Rifles and the militia, previous to their departure; and on the 21st May, 1870, the first detachment of the expedition left Toronto for Thunder Bay. It consisted of 3 officers (including myself) and 51 men of the 60th Rifles, under Captain Ward, and 1 sergeant and 3 men of the Army Hospital Corps; it was accompanied by Colonel Wolseley and some of his staff, and also by Mr. Dawson.

The men were armed with the short Snider breech-loading rifle, and carried 60 rounds of ammunition. The officers were supplied with breech-loading rifle carbines, and also carried 60 rounds. In addition to this weapon, the regimental officers were allowed to carry any others they chose, except swords; and on the day of their departure, appeared with their persons profusely decorated with revolvers and deadly-looking scalping-knives. No one could take a large wardrobe with him, as the regulation-weight of baggage allowed to each officer, 90 lbs., was strictly enforced, and the men had only what they could carry in their knapsacks. No one officially connected with the equipment of the expedition, as far as regarded clothing, could have had much idea of the description of work the troops would be required to undertake, or, doubtless, a more suitable kind of dress would have been supplied.

The Northern Railway Company put on special trains for the conveyance of the troops to Collingwood, a distance of 94 miles from Toronto; and on our arrival there, we at once embarked on board the fine steamer *Chicora*, one of the line of mail-steamers plying between Collingwood and Thunder Bay. A great number of the horses which were to be used in the transport-service were shipped on board the *Chicora*, under charge of some of the men who had been engaged as drivers and teamsters. Most of these men were singularly ignorant of their duties, and in several instances were detected in the act of ill-treating their horses; and the severe examples made of those so detected proved to any others

similarly inclined that the *Society for the Prevention of Cruelty to Animals* had its representatives in uninhabited as well as in inhabited regions. The *Chicora* sailed that evening, and on 23rd May we arrived at the *Sault St. Marie.* Here we had to land the troops and munitions of war, and send the steamer almost empty through the canal on the American side of the St. Marie River. On the first trip of the *Chicora* that season, she had been refused a passage through the canal by the American government, and had to land all her freight on the opposite side. Had she been refused admittance on this occasion, whether empty or otherwise, it would not have given us any extra trouble, as the *Algoma*, another steamer of the same line, had been sent through empty some time since, and was kept on Lake Superior in case of such an emergency. Besides the *Algoma*, the propellers *Brooklyn* and *Shickluna* had been chartered. The *Chicora*, however, passed safely through; and after a march up the banks, of about three miles, the men were again embarked and the stores shipped.

A detachment of militia, consisting of two companies, under the command of Lieut.-Colonel Bolton, had been sent to the Sault St. Marie to assist in the transport of the stores from Lake Huron to Lake Superior; and hearing reports that a Fenian cruiser had been heard of in the latter lake, Colonel Wolseley determined upon sending one company on board the *Shickluna*, which had three schooners, laden with stores, in tow, to protect it in case of necessity. Lake Superior was safely crossed, and early on the morning of 25th May the high and imposing headland of Thunder Cape was in sight. The entrance to the Bay is between Thunder Cape, 1,350 feet above the level of the lake, and Pie Island, which lies four or five miles to the south-west, at an elevation of 850 feet. A few hours afterwards saw us at anchor off the depot, which had been formed at the commencement of the Dawson Road, and which was named Prince Arthur's Landing by Colonel Wolseley. We had heard a great deal of the beauty

of Lake Superior, and certainly had during our voyage passed through some very fine scenery, and, consequently, were very much disappointed at the desolate appearance which Prince Arthur's Landing presented on our disembarkation. A fearful fire, extending over a surface of many square miles, had lately raged over the country between the Landing and Shebandowan Lake, destroying a great deal of the road and some of the bridges on it. A forest through which fire has passed presents a melancholy spectacle. Half-burnt trunks of trees here and there stand erect, shorn of branches, waiting for another conflagration or strong wind to prostrate them to the ground. There they lay, piled in horrible, blackened confusion, until the destroying element, passing over again, completes their destruction.

The forest had formerly extended to the water-side; but the fire had saved us the trouble of clearing the ground for our camp, which was pitched on a hill not far from the lake. The fire had only taken place a short time prior to our arrival; and although, happily, no lives were lost, some persons had very narrow escapes from it. Mr. St. John, the special correspondent of the Toronto *Globe*, attached to the expedition, told me that he had to drive for his life on his return from a survey of the road, and that had he not been within half a day's journey of Lake Superior at the time, he must have been overtaken by the flames. Four miles from the Landing is the mouth of the Kaministaquia River, or Kaministakwoya, according to Sir John Richardson, "the river that runs far about;" half a mile up which, on the left or north bank, Fort William, one of the principal posts of the Hudson's Bay Company, is situated. At a distance of two miles from the Fort is the mission of the Immaculate Conception, which is under the charge of the Reverend Pierre Choné, who has for many years resided there. Three miles further up the river lies McKay's Mountain, which has an elevation of 1000 feet above the lake. Six miles north

of the Landing is the Current River, near which are the Silver Mines, owned at that time by a Montreal mining company.

The first care of the British soldier, on settling down, is to make himself as comfortable as he possibly can, under the circumstances; so the tents were pitched on the softest piece of ground that could be discovered, and the daily rations of Her Majesty to her soldiers on service—salt pork, tea, and biscuit—were speedily served out.

To each man the following ration was issued daily:

1 lb. biscuit, or 1½ lbs. bread or flour;
1 lb. salt pork, or 1½ lbs. fresh meat;
2 oz. sugar, 1 oz. tea, ⅓ pint beans, or ¼ lb. preserved potatoes.

As we had no fresh meat on the day of disembarkation, we were obliged to put up with the salt pork.

Among the men there are generally a good many that are very fair cooks; consequently, they got on all right; but in the case of the officers, it was different. From Colonel Wolseley downwards, all had at first a great objection to have recourse to the services of a professed cook: we had come there determined to rough it, and rough it we would. A solemn conclave was held, which resulted in my being appointed cook to the commander-in-chief, with one of my brother-officers to assist me. I never saw a piece of pork cooked in my life, but determined to do the best I could. I seized some sticks, lighted them, threw a huge junk of pork into a pot of water, put it on the sticks, and sat down to watch the effect. The fire was soon exhausted, and so was my patience; and, like a bad workman blaming his tools, I was just beginning to abuse the pork for not boiling, and the fire for not burning, when the arrival of the colonel put an end to my difficulties. He shewed me, in the scientific manner of an old campaigner, how to dig a

trench in the ground, and with stones and sticks to construct a fender over it, on which to place my cooking-utensils; and the result was, that when dinner-time approached, a hard, tough mass of over-boiled meat was fished out of the pot, with the assistance of a forked stick, and served up, with tea and biscuit, as the mid-day repast of the officers.

Hard work, of every description, went on day after day, commencing at sunrise, and everybody seemed to work with a will. A large raft, or scow, was employed for the purpose of bringing the horses and stores from the ship to the landing, whence they were conveyed to the different tents and sheds prepared for them; and road-making and the preparation of the militia camp were also commenced. An examination of the road shewed it to be in anything but the good condition reported. Thirty miles of it were considered as made; but from the nature of the ground in heavy weather, many parts became almost impassable. Twelve miles were cut through the forest; but the stumps and roots of the trees had not been cleared away, nor the road corduroyed in swampy or muddy parts. The remainder of the distance to Shebandowan Lake had not been touched, and was still virgin forest. A large number of troops were daily employed at work on the road. The soil being principally sand and peat, for some distance, it was necessary to lay down on it what is called corduroy, as, after a heavy rain, the road became so slippery and uneven, that the horses were unable to drag their heavy waggons over it without great labour. Logs of wood, ten or twelve feet long, were cut and laid down on the road, side by side, and branches and earth thrown over them to keep them packed close together; in the swampy places, drains were dug and small bridges built, in order to prevent the road being flooded after a fall of rain.

On 27th May, another detachment of the 60th Rifles arrived in the steamers *Algoma* and *Brooklyn;* it was accompanied by Mr. Simpson, the member for the district

of Algoma, who was on his way up the country to conciliate the Indians and explain the object of the expedition. Day after day, steamers and schooners arrived, bringing troops and stores from Collingwood. The militia regiments were encamped about half-a-mile from the landing, and employed like the regulars in working on the road and landing stores from the ships. A large flat-bottomed scow was worked by a rope from the vessels to the wharf, and for five weeks we had the services of a small tug.

While at Thunder Bay, we had an opportunity of seeing for the first time in many cases the red-skin in full paint and feathers. Three Chippewa Indians and a squaw arrived from Fort Francis, in order to see what was going on, and report accordingly to their tribe. They were headed by a chief of the tribe, named Black Stone, who was attired in rather a richer dress than the others, and wore a sort of crown on the back of his head, formed of porcupine quills and eagle's feathers, bound round with mink and ermine. They were introduced formally to Colonel Wolseley, and proceeded at once to the object of their visit, which was, in reality, to get as much out of him in the way of presents and food as they could. They avowed their great loyalty to the Queen, but were very much astonished at finding she had not considered it necessary to ask their leave before cutting a road through their territory. They were assured that we had no intention of appropriating their lands, but merely wished for a right of way. This explanation seemed to give satisfaction, for they at once consented to allow us as much wood and water along the route as we desired. The band seemed to astonish them; but they were too dignified and haughty to express any surprise. They stayed at the landing until 6th June, and then returned to Fort Francis.

As it was feared that the Fenians would attack the landing after the departure of the expedition, a redoubt, or small fort, with a magazine inside it, was constructed for the reception of the ammunition, which was to be left

behind. A company of the Quebec militia, under Captain De Bellefeuille, with two subalterns, was left behind in charge of it.

The River Kaministaquia, flowing out of Lake Shebandowan, is joined by two others of the same size before it empties its waters into Thunder Bay. It was believed that the navigation of this river by the boats was impossible, on account of the numerous and dangerous rapids and falls; but as the road was in a very incomplete state, Colonel Wolseley determined to send a company up this river as an experiment. It was commanded by Captain Young; and the success which attended the great efforts made by his men justified the selection made by the Colonel, as this route to Shebandowan now rendered us independent of the road. Other companies, both of regulars and militia, were afterwards sent up by the Kaministaquia.

The scenery on the Kaministaquia is very fine; the Kakabeka Falls, 30 miles from Lake Superior, being one of the most picturesque spots visited on the route. These falls are 120 feet high, and are at an elevation of 175 feet above the level of Lake Superior. The length of the road from Thunder Bay to Shebandowan is from 46 to 48 miles; at the place where it crosses the Kaministaquia, 21 miles from the bay, and also five miles further on, where it crosses the Mattawan, bridges had been built and depots formed for the forwarding of stores to the lake.

Different companies were stationed at these places, in order to assist in the completion of the road. As the work progressed, more detachments of troops were sent from Thunder Bay, and those in advance sent on towards Lake Shebandowan. The company to which I belonged left the landing at three o'clock on the morning of the 3rd July, and proceeded by a march of two days to the Mattawan Bridge, followed the day afterwards by the head-quarters of the expedition. During this march, the men of my company

for the first time found the use of the mosquito-nets with which they had been supplied. These veils are made of fine net, made to fit close round the cap and neck, and are kept off the face by a crinoline wire. They were seldom used after we left Lake Shebandowan, except for the purpose of straining muddy or discoloured water preparatory to making tea. During the time that the men were on the roads, they were too busy to mind the attacks of the rapacious mosquito; and at night they used to keep it out of their tents by lighting a small fire inside, and allowing it to smoulder till the tent was full of smoke. No insect of any kind would then come near.

The officers in charge of the companies which had been sent up to the Mattawan Bridge by the river, complained bitterly of some of the men who had been engaged as *voyageurs*, but praised the skill and courage of the Iroquois Indians. Like the teamsters of the transport-service, the former seemed to have been engaged indiscriminately, whether they had had any experience or not in managing boats in rapid water. I know, for a fact, that one man had left his situation as driver of the omnibus belonging to the Queen's Hotel, in Toronto, in order to follow the fortunes of the *voyageurs;* and another, in answer to my enquiry whether he had ever been in a boat before in his life, answered, indignantly: "Why, certainly! isn't my brother boss of a steam-tug in Toronto?"

Gradually we worked our way towards the lake—the point at which our road-making labours would cease. Young's Landing, three miles from the Mattawan Bridge, so called after the officer who may justly be entitled the pioneer of the Kamanistaquia; Brown's Lane, or Calderon's Landing, seven miles further on, and Oskondaga Creek, were passed in their turn. From Brown's Lane most of the stores were sent up by the Mattawan River to Oskondaga Creek, in consequence of the incomplete state of the road; and on their arrival at the latter depot, they were forwarded

by road to the Dam-Site, or Ward's Landing, where they were again shipped, and sent four miles up the river, to McNeill's Bay, in Shebandowan Lake. Colonel McNeill, the present Military Secretary to the Governor-General, was stationed at the lake to superintend the departure of the different brigades of boats, the provisioning of which was undertaken by two officers of the Control Department. The boats, as they arrived, were hauled up on the beach of the lake to be repaired by a ship's carpenter; and much they needed it after the rough treatment they had undergone on the rocks in the rivers, and the jolting they had received when on the top of the waggons. When ready again for use, they were launched and distributed in brigades of six to each company, each boat being intended to carry nine or ten soldiers, besides three Indians or *voyageurs*. Fortunate was the officer who secured for his boat the skilful Iroquois, the finest boatman in Canada; whilst he who was entrusted to the tender mercies of the ex-omnibus-driver soon came to the conclusion that in the stable, not in the boat, was where his guide found himself most at home.

Sixty days' provisions, consisting of salt-pork, beans, preserved potatoes (sent out from England expressly for the expedition), flour, biscuit, pepper, salt, tea, and sugar, were issued to each brigade. Besides provisions and spare stores, each boat had to carry camp equipment, ammunition, and an arm-chest, containing the rifles, cooking-utensils, and the men's own scanty allowance of baggage, consisting of their knapsacks, with two grey blankets and a waterproof sheet each. With each brigade was a carpenter's tool-box, which was found of great use, and contained the requisites for mending the boats. The distance to be travelled by water was about 560 miles. The boats, which were built in Quebec, were 31 in number, and were all of the carvel build; sixteen of them were rigged with sprits, and the others with lug-sails. They had been constructed under the superintendence of Mr. Pentland, assisted by Captain Dick,

the latter a gentleman who has long been in charge of the ship building yards of Messrs. Allan Gilmour & Company, by whom he was recommended. The remainder of the boats, 119 in number, were clinker-built. The average length of the boats was 32 feet and 6 feet beam; each could fit-up two masts, and six oars were generally used. A light gig and three large bark-canoes were supplied for the staff. The boats and *voyageurs* not required for the conveyance of troops, were employed in forwarding a reserve of supplies to Fort Francis. Along the route, about 42 portages, varying in length from 40 to 1800 yards, had to be crossed; and portage-straps and slings, to be used when carrying the stores across, were issued to the different boats. Up to the time that the different detachments left Shebandowan, they had been supplied with fresh meat, except when going up the Kaministaquia; but when they started across the lake, until they reached Fort Garry, they had neither fresh meat nor vegetables, except at Fort Francis and Fort Alexander, where a few head of cattle were procured. Fresh bread had been baked at Prince Arthur's Landing, Mattawan Bridge, and the Dam-Site; and as field-ovens were taken by the Army-Service Corps, we had bread again at Fort Francis and Fort Garry. It was always excellent—as, indeed, were the other rations of every description that were issued. The ration of pork, 1 lb., was hardly sufficient for a man who had worked from 3 a.m. until 6 p.m., incessantly; and had it been increased to 2 lbs., the men would not have found much difficulty in disposing of it. In fact, so hungry were they, sometimes, that I have seen a man eat his salt pork *raw*, as he could not wait until it was cooked for him.

The distribution of the force was as follows:—The Royal Artillery, Royal Engineers, and 60th Rifles were to proceed to Fort Garry, and return without delay. The Ontario battalion was to proceed to Fort Garry, leaving one company encamped at Fort Francis until 1st September, when it was to proceed to Fort Garry by the north-west angle of the Lake of the Woods. The Quebec battalion

was to proceed to Lower Fort Garry, or the Stone Fort, with the exception of one company left at Prince Arthur's Landing until the return of the regulars, when it was likewise to return to Montreal.

In order to give you some idea of the weight of the cargo the men had to pull in the boats, and carry over the portages, I will describe the exact quantity of stores with which my boat was loaded before leaving McNeill's Bay:

Pork—9 barrels, at 200 lbs. each=1800 lbs. Flour—7 barrels, at 100 lbs. each=700 lbs. Biscuit—5 barrels, at 100 lbs. each=500 lbs. Tea—3 canisters=50 lbs. Beans—2 bags=60 lbs. Potatoes—2 boxes=80 lbs. Ammunition—2 boxes=100 lbs. Total, 3,290 lbs. Our boat and camp-equipment also added considerably to the weight.

A bottle of mosquito-oil, which was not of the slightest use, was put in each boat; it smelt so horribly, that the men would seldom use it on their hands and faces, and much preferred being bitten by the insects it was supposed to protect them from. However, when the supply of coal-oil failed, it came in handy.

The portage-strap is a long piece of cariboo-hide, from 2½ to 3 inches wide in the centre, and tapering off gradually towards the ends, in order to enable it to be secured or fastened round the barrel or package. The Indians, skilled in its use, shewed the men how to fasten it, so that the load would rest on the upper part of the back, and lie there by the strap passed round the forehead. Short slings, made of rope, for carrying the heavy barrels over the portages, were also supplied: these slings had a loop at each end, and with two short poles formed a sort of hand-barrow, in which the pork could be carried by those who were unaccustomed to the use of the portage-strap. The men soon got into the way of carrying heavy loads with the portage-straps, and the slings were then discarded.

On the evening of Saturday, 16th July, the first two brigades of boats, consisting of two companies of the 60th Rifles, under command of Colonel Feilden, left McNeill's Bay, on their long journey of nearly 600 miles: they were accompanied by a detachment of Royal Engineers and of Royal Artillery, with two of the seven-pounder mountain-guns, mounted in boats, especially prepared for them. On the 17th July, two more companies, under Captains Dundas and Buller, started. On the 18th July, one company, under Captain Northey, was despatched. This brigade was accompanied by Colonel Bolton, D. A. A. General; and on Tuesday, the 19th, Captain Wallace's company, to which I was attached during the expedition, left. Captain McCalmont, an officer of the 9th Lancers, who had come out from England to join the force, took passage with us. The following day, 20th July, Captain Calderon's company left—the last of the regulars. During the advance, the expeditionary force, from front to rear, covered the route for 150 miles. Very few guides could be procured to pilot us to Fort Francis; but on arrival there, Indians and half-breeds, accustomed to the navigation of the Winnipeg River, were engaged. Thus, the first detachment of the expedition left Shebandowan on July 16th; and on August the 2nd, the last company of the militia was despatched. I propose, now, to follow the fortunes of my own company during the advance to the Red River.

Shebandowan Lake is about 21 miles long and six miles across in its widest part: the entire length of the lake, which runs in a west-by-north direction, has to be traversed before reaching the portage leading to the Kashaboiwe Lake. The stream by which the Kashaboiwe Lake discharges its waters descends about 29 feet, in its course of 70 chains, to Lake Shebandowan. Besides the boats which conveyed the company, there was one which was appropriated to the use of the Army-Service Corps, commanded by Mr. Mellish: this officer, not being quite sure

of his swimming abilities, should they be called into requisition, had been careful to select the largest boat he could find ready for use; whereas the other officers had been anxious to obtain those of the smallest and lightest build. The beautiful evening on which we started seemed an augury of fine weather, and success on this our start into the depths of an almost unknown wilderness, and the spirits of the men were high in consequence. The hard work they had done on the roads and rivers for the last month, and the healthy life they had led in the open air, made them well fitted for the great task they had in hand. No spirits were issued or allowed, but a large quantity of tea instead; and the fact that, from the commencement to the end of the expedition, sickness of any consequence was unknown, proved that the temperance plan succeeded, indeed, admirably.

Not wishing to tire the men the first day, the officer in command halted the little fleet about 8 p.m. The boats were then safely moored on the beach, and a tent pitched on the banks of a land-locked bay for the night. The men, anxious to accustom themselves to bivouacking, preferred to sleep in the open air, in order to be ready to make an early start in the morning. One of the most violent thunder-storms I ever witnessed passed over us that night: the rain for hours poured down incessantly, and the flashes of lightning were frequent, and of extreme brilliancy. The men were huddled together under the tarpaulins and water-proof sheets, as they had not had time to pitch their tents before the fury of the storm was upon them. Early in the morning the boats were taken to a safer anchorage, as we feared the strong wind would blow them on shore. Several times we attempted to start, but were unable to make any way against the high sea that was running, until the evening, when the wind abated. The following day, we arrived at the Kashaboiwe Portage.

I will now describe the manner in which the boats were conveyed across the portages. The stores were first carried

across, and piled, ready for re-shipment, close to the water-side. The boats were then hauled ashore, and the tow-lines fastened to their bows. The men then harnessed themselves with their portage-straps and slings to the tow-lines; and the boats, with a few men on either side to keep them on their keels, were dragged over the skids of wood laid down to serve as rollers along the portage. As the companies in front of us had cut the skids and laid them down, we got over the portage without much delay, in spite of the great quantity of stores we had to carry.

On July 22nd, steering due north, we crossed Lake Kashaboiwe, which has a surface-area of 8 square miles, to the Height-of-Land Portage, one of the longest on the route, being over a mile; and it was not until the 25th of July that we launched our boats again for the voyage across the Lac des Milles Lacs, $20\frac{19}{100}$ feet above the level of Lake Shebandowan. This lake is of great size, and of a very curious and straggling shape, and, from the innumerable islands in it, well deserves its name. It was, therefore, extremely difficult to find our way across it, as our Chippewa guide several times lost his way. We were, however, more fortunate than some of the other companies, the guides of which allowed them to wander for miles out of their course, thereby losing a great deal of valuable time. After passing the Height-of-Land, we had the stream in our favour for the rest of the way. In the Lac des Milles Lacs, we met, for the first time, the savage in his native wilds. The Indians we met here belonged to the same tribe as the haughty chief who had visited us at Thunder Bay, and were certainly the ugliest and dirtiest people I ever saw. Immediately they saw us, they paddled round and round the boats, begging for provisions, and offering to exchange the fish they had caught for pork and flour. There were seldom more than three in each canoe, and could propel their little craft through the water at a great rate. Some of them had curiously-worked tobacco-pouches, made of beads and silk, and other

articles of similar interest. Upon their bodies they wore very little clothing, and allowed the burning sun to shine down on their heads with no other protection against it than the long black hair they wore almost down to their shoulders. As they sat paddling in their canoes, I could seldom tell the men from the women, they were so much alike in dress and appearance. When we camped, they would remain near us all night, in hopes of getting something; and when we left, they would stay behind and eagerly search the ground for any bits of biscuit that might have been left.

They live in wig-wams, made of birch bark stretched over poles driven into the ground in a circle, and meeting at the top. A hole is left at the top to let the smoke of the fire out. When on the move, they generally take the birch bark with them, but leave the poles standing, Knowing the dirty habits of these poor people, we were careful to avoid pitching our tents anywhere near the remains of a wig-wam. How they manage to find means of subsistence during the long winter months, is a marvel; but in the summer they live on the fish with which all the lakes and rivers are abundantly stocked, and on the wild fruit which grows in plenty on shore. The woods are singularly destitute of game of any description.

Our work began at 3 o'clock in the morning, and before starting the men had some hot tea and biscuit. Afterwards, tents were struck, and stowed away again in the boats. At eight o'clock we stopped for an hour for breakfast, and at one o'clock for an hour for dinner. While the former meal was preparing, the lake was alive with human figures swimming and splashing about; for, thanks to Mediterranean experience, there were few in our regiment who were not skilled in the useful art of natation. Dinner over, we did not halt until dark, when tents were pitched, or, if the weather were fine, a bivouac for the night prepared. The rations, consisting of a pound of pork and a pound of biscuit or flour, with beans, tea, and sugar, were then served out, and supper cooked over the camp-fires, around which we sat

while our meal was preparing, discussing the adventures of the day. Sometimes our daily fare was varied with the fish we had caught from the boats with a trolling-bait, or bought from the Indians. We used to make the flour into a sort of pan-cake, known among the men by the unappetising title of "choke-dog," from the extreme tenaciousness with which it was wont to stick in our throats when endeavouring to relieve the pangs of hunger. The biscuit was always very good, and when fried in pork-fat, and served up hot and greasy, was much relished.

After traversing the Lac des Milles Lacs, for a distance of 21 miles, the next portage, the Baril, was reached. Here we had to drag the boats up a steep incline of about 100 feet, and had very hard work. The Baril Portage, which leads into Baril Lake, is about 400 yards across. Eight miles across Baril Lake, which is the counterpart of the extremity of Lac des Milles Lacs, brought us to the *Brulé*, or Side-Hill Portage, the scenery round which was very pretty. On leaving the portage the boats were poled down a narrow stream for a mile and a-half, when we passed into Lake Windigoostigon, or Cannibal Lake, so called in commemoration of a deed of violence committed there by a band of Ojibways, in the year 1811. When crossing this long stretch of water, the wind, blowing strongly from the S. S. W., was dead against us, and, consequently, made our progress for some time rather slow. A row of twelve miles brought us to the entrance to the French River, down which we went at a great pace, a strong stream being in our favour. The numerous shoals and rocks in this river made the navigation dangerous in the extreme, and several boats received damage that compelled the officers in charge of them to run in-shore and bivouac for the night; in the meantime, the remainder of the boats had gone on to the Great French Portage, at which they did not arrive until nearly ten, p. m. By going down the French River we saved about a mile of portage. The water-level at the head

of the French Portage is 55 feet below that of Lac des Milles Lacs. The timber on this portage consists of aspen, pine, and spruce. The French River flows into the Little French Lake, and another small river flows thence into Lake Kaogassikok. While crossing this lake, with a fine breeze behind us, we were overtaken by the mail canoe from Fort William to Fort Francis.

Mr. McIntyre, the Hudson's Bay officer at Fort William, had engaged to despatch a canoe every week on the arrival of the mail-steamers from Collingwood. It was manned by two half-naked savages, who gave us their mail-bags to look over, and allowed us to sort any letters and papers that there might be for our brigade. They seemed to fully appreciate the position they held, and pointed with great exultation to the small Union-Jack flying on the bow of their canoe, as they paddled swiftly away.

The next Portage was the Pine, 27 miles from the French Portage; thence across a small lake to the Portage des Deux Rivières, which, in a distance of 32 chains, brought us down 117 feet, into Sturgeon Lake.

The Deux Rivières Portage was one of the most difficult we had as yet encountered: in the centre of it was a high rock, up which a ladder of felled trees had been constructed; and at the side, steps were cut for the men to carry their loads up. Had one of the ropes snapped when hauling the boats up this ladder, the men at work would, doubtless, have received very severe injuries, and the boat been broken, to a certainty. At the mouth of Sturgeon River, leading into the beautiful lake of that name, we saw a sturgeon for the first time. As Longfellow would describe it:

> On the white sand of the bottom
> Lay the monster Mishe Nahma—
> Lay the Sturgeon, King of Fishes:
> Through his gills he breathed the water;
> With his fins he fanned and winnowed.

The King of Fishes did not reign very long in this instance, for he was no sooner seen than an ounce of shot put an end to his existence. The Indian who discovered it was so excited, that he jumped out of the boat into the water, and returned, bearing the prize in triumph. He undertook to prepare it for our supper; and the roe, artistically cooked by one of the officers, was voted most delicious by all who tasted it.

The scenery on the Sturgeon Lake is well described by Professor Hind, in his narrative of the exploring expedition of 1857. He says:

"No lake yet seen on the route can bear comparison, for "picturesque scenery, with Sturgeon Lake. The numerous "deep bays, backed by high wooded hills or rocks, rugged "or smooth, according to their aspects; its sudden "contraction into a river-breadth for a few yards between "large islands, and the equally abrupt breaking-out again into "open stretches of water, offered a constant and most "pleasing variety of scene. The high, jutting points of "granite rock, which here and there confine the channel, "offer rare opportunities for beholding on one side an "intricate maze of island scenery, and on the other an "open expanse of lake, with deep and gloomy bays, "stretching, seemingly, into the dark forest as far as the "eye can reach."

After rowing the entire length of Sturgeon Lake, or, rather, the succession of lakes and rivers bearing that name, we arrived at the River Maligne, where there were several dangerous rapids to be run. At the first rapid, an Iroquois Indian, named Ignace, had been stationed with a band of skilled boatmen, consisting of Iroquois and French-Canadians, for the purpose of steering the boats down. To the indignation of the ex-omnibus-driver I before mentioned, and other *voyageurs* of his stamp, Ignace commenced his operations by turning every one out of the boats, except four soldiers left in each to row.

Three pilots then got into each boat, and, with their long paddles and sweeps, steered into the middle of the foaming waters. With a rush, and pulled as hard as the strong arms at work were capable of, the boats entered the rapids. The slightest mistake on the part of the steersman, and they would have been smashed to pieces on the huge rocks that we passed closer than was pleasant. Everyone worked as if for his life; and the wild cries of the Indians, as they shouted directions to each other in their strange language, made those looking on from the shore feel certain that some accident was going to happen; but the cheers and laughter of the crews, as the boats were pulled into smooth water at the foot of the rapids soon dispelled the illusion.

The river Maligne flows into Lac Lacroix, or the great Nequaquon Lake, from which we passed into Loon Lake and Nameukan Lake. While camped on an island in the latter, we were visited by about 100 half-starved, miserable-looking savages, who tried hard to induce us to part with some of our provisions. We had very little to spare, but gave them some flour and biscuit, in hopes of getting rid of them. Having crossed the Bare Portage, we came into the fine expanse of Rainy Lake, 50 miles long by 38 broad, and having an elevation above Lake Superior of 435 feet. A voyage of 40 miles along the lake, steering W. by N., brought us to the Rainy River, two miles down which Fort Francis, a post of the Hudson's Bay Company, is situated.

General Lefroy made Rainy Lake 1,160 feet above the sea, by barometrical measurement: he describes its shores as low, sterile, and rocky, timber being very poor, and, on the whole, the general aspect of the shores of the lake as very forbidding, and furnishing almost everywhere, on the ridges and hill-flanks, a picture of hopeless sterility and desolate waste. At the entrance to the Rainy River the scenery is very pretty, and the green and luxuriant foliage of the trees formed a pleasing contrast to the barren wilderness through

which we had lately passed. After leaving Rainy Lake, we arrived at the head of the fine falls named the Chaudière, and saw Fort Francis lying on our right. Some days before our arrival, the Fort had been the scene of a great Indian meeting, which was called by the chiefs of the tribes, to have what they called a "pow-wow" with Colonel Wolseley. Mr. Mackenzie, the officer of the Company in charge of the Post, received us very kindly, and gave us some vegetables and other similar delicacies, which were much appreciated after our monotonous daily fare of fried pork and "choke-dog." The Commander-in-Chief had already arrived there, but said, "Good-bye! good-bye! go on! you are a long way behind the rest!"—almost before we had time to say "How do you do?" to him!

We replenished our stock of provisions, and left behind the useless *voyageurs*; and having obtained a guide who was experienced in the navigation of the Winnipeg River, we again embarked, and continued our voyage down the Rainy River that evening. The general course of this fine river is a few degrees to the north of west, for a distance of 80 miles by the winding of the river, and in an air-line 60 miles: the current is gentle and uniform throughout, except in the two rapids, called, respectively, the Manitou and Long Rapids, which let the river down about 5½ feet. The breadth of the river varies from 200 to 300 yards; its banks are thickly wooded with elm, balsam, poplar, ash, and oak. Sturgeon are very numerous, both in this river and in the Lake of the Woods, and form the staple food of the Indians, who preserve the flesh by drying it like pemican, and after pounding it up and mixing with oil, put it into bags made of sturgeon-skin. All night we drifted slowly down the river, two men sitting up in each boat to row while the others slept.

The Lake of the Woods, into which the Rainy River flows, is 72 miles in length, and is 377 feet above Lake Superior, or 977 feet above the level of the sea. From the

mouth of the Rainy River to Rat Portage, the place where the Winnipeg River issues, is about seventy miles.

Having a strong breeze in our favour all the way across, we made a rapid passage, and arrived at Rat Portage, another post of the Hudson's Bay Company, on August the 11th, having done the distance from Fort Francis, on the Rainy River, in 72 hours, which we were told was the fastest passage on record.

Mr. Hind describes the Winnipeg River as follows: "Issuing from the Lake of the Woods through several gaps "in the northern rim of the lake, the River Winnipeg flows "through numerous tortuous channels for many miles of its "course, in a north-easterly direction. Some of the channels "unite with the main stream ten to fifteen miles below Rat "Portage, and one pursues nearly a straight course for a "distance of sixty-five miles, and joins the Winnipeg below "the Barrière Falls. The windings of this immense river are "very abrupt and opposite, suddenly changing from north-"west to south-west and from south-west to north-west, for "distances exceeding twenty miles. In its course of 163 "miles, it descends, by a succession of magnificent cataracts, "349 feet.

"Some of the falls and rapids present the wildest and most "picturesque scenery, displaying every variety of tumultuous "cascade, with foaming rapids, treacherous eddies, and "huge swelling waves, rising massive and green over "hidden rocks. The pencil of a skilful artist may succeed "in conveying an impression of the beauty and grandeur "which belong to the cascades and rapids of the Winnipeg; "but neither sketch nor language can portray the astonishing "variety they present, under different aspects, in the grey "dawn of morning, or rose-coloured by the setting sun, or "flashing in the brightness of noonday, or silvered by the "soft light of the moon."

The Hudson's Bay Company's Fort at Rat Portage is on an island at one outlet of the Lake of the Woods, and is under the charge of Mr. Macpherson.

Mr. Butler, of the 69th Regiment, who had been employed on secret service in the Red River Settlement, met us on our arrival, and gave us a very alarming description of the dangerous rapids through which we had to pass on our voyage down the Winnipeg. He had just returned from Fort Garry, and described the Settlement as being in a very disturbed state. When he left, the Fenian flag was flying from the Fort. I had forgotten to mention that when crossing the Lake of the Woods, we had met a party of *voyageurs* from Fort Garry, which had been sent by the loyally-disposed residents there to urge Colonel Wolseley to push on the advance of the troops, on account of fresh disturbances and deeds of violence, and also to assist us in navigating the Winnipeg. The party was under the charge of a Mr. Monkman, whose experience of the country and knowledge of the people proved of great service to the expedition. Having crossed Rat Portage, a row of nine miles brought us to the Les Dalles Rapids. A short time before we arrived there, I had an opportunity of testing the truth-telling capacities of the Indians, whose veracity is generally much doubted. A handsome-looking savage, accompanied by his boy, paddled up to my boat from the shore, and made signs that he wished to exchange some fish and ducks for flour. I accosted him, first in English, then in French, and told my Indian to speak to him also; but he shook his head, as if denying any knowledge of the languages. Having got what he wanted, he paddled away, and, turning round in his canoe, shouted out, in excellent English: "Good-bye, boys!" Hearing one's native tongue in such an uncivilized region, from the mouth of a savage, was certainly a great surprise. He must have picked up some knowledge of the language at the posts of the Hudson's Bay Company, and, wishing to appear before us a savage to perfection, half-starving with hunger, thought it best to shew ignorance.

The Les Dalles Rapids are 20 chains in length, with a fall of 3 feet, and boats and canoes can run them with safety. Then 21 miles more of river, and we ran the Grande Décharge, a fall of 6 feet. The channel is very narrow and swift. The Yellow Mud Falls and Portage, the Pine Portage, with the dangerous Cave Rapids, which have often proved so destructive to the bateaux of the Hudson's Bay Company, and the De L'Isle Rapids, were passed safely in succession; and we came next to the beautiful falls and cascades named the Chûte-à-Jacquot, which occasion a fall in the river of nearly 13 feet. Having crossed the Portages named the Trois Points de Bois, which let the river down 37 feet, we arrived at the Slave Falls, the scene of one of those terrible incidents in Indian life formerly of frequent occurrence in these inhospitable wilds. Tradition tells that a slave of a ferocious master, maddened by long-continued cruelty, calmly stepped into a canoe above these falls, in the presence of the tribe, and, suddenly pushing off from shore, wrapped her deer-skin robe round her face, and glided over the crest of the cataract, to find rest in the surging waters below. The next falls were the Barrière and the Otter, both of which were passed safely. At the former we met a party of Hudson's Bay *voyageurs* on their way from Fort Garry to Fort Francis, with stores: they reported that Riel was still in possession of the Fort, and did not believe that the troops would ever reach him.

A distance of seven miles from the Otter Falls lie the dangerous Seven Portages. The navigation between each of these portages is difficult and dangerous; and although we got safely past them, the other companies, both in front and behind us, were not so fortunate, as was proved by the wrecks of boats hauled up on shore, which we saw on our return journey. The 1st Galais de Bonnet, 2nd Galais de Bonnet, Grande Bonnet, 1122 yards long, Petit Bonnet, and the White Mud, were the next portages we had to cross before reaching the Silver Falls, which Professor Hind describes as being, perhaps, the most imposing and beautiful of all the

cascades on the Winnipeg. He says:—"The volume of "water precipitated here is immense, all the inosculating "branches of the Winnipeg uniting some distance above the "magnificent Silver Falls. The vast torrent descends a "slope about 200 yards long, with an inclination of nearly "sixteen feet, in the form of five or six gigantic swells. "The observer may stand close to the huge heaving waves, "and watch them rush past him with astonishing velocity "and ever-changing form. Sometimes they send a thin "sheet of water over the smooth rock on which he is "standing, at the edge of the torrent; in another minute "there may be a gulf ten or fifteen feet deep, with a terrible "whirlpool raging below, between him and the crested "swell, fifty feet from the shore; suddenly the gulf is filled, "and the turbulent waters, dashing against the rocks, send "a shower of spray far and wide over the polished gneiss "which confines them."

Eleven miles, with one portage more, and the dangers of the Winnipeg were over.

We reached Fort Alexander, the appointed *rendezvous* of the regular troops, on Friday, 19th of August, having thus completed the navigation of Rainy River, Lake of the Woods, and the Winnipeg River, with twenty-six portages, in eleven days. All were in good health and spirits, and right glad that we had got so far on our journey without a serious accident of any kind occurring. It must have been gratifying to Colonel Wolseley, on his arrival in his canoe from Fort Francis, to hear the hearty cheers with which he was welcomed by the little force that had done so well.

By the 20th of August all the companies of the regulars had come in; and on Sunday afternoon, 21st August, the boats, to the number of fifty, started for Lake Winnipeg, which was reached after a row of two miles down the river. A south-west wind in our favour enabled us to make Elk Island, eighteen miles north-west from Fort Alexander,

before we halted for the night. In a wonderfully short space of time the boats were hauled up on the beach, and numerous camp-fires lit, round which crowds of hardy red-capped soldiers were crowding. Before day-light next morning the bugles blew the *réveillé*, and after the usual tea and biscuit we once more started, steering south-west for the Red River.

Lake Winnipeg, an Ojibway word, signifying "dirty water," is said to occupy 8,500 square miles; its greatest length being 280 miles, and its breadth varying between 6 and 60 miles. Numerous observations have established its height above sea-level to be between 600 and 630 feet, and its elevation above Lake Superior is about 28 feet. Frequent storms, of great fury, prevail on this lake, making its navigation by small boats and canoes extremely hazardous. Lake Winnipeg is in the centre of an immense plateau. The large rivers which drain the plateau converge towards it: they flow from the east, the south, and the west, and, having mingled their waters, pass through a common channel into that great salt-lake, the Hudson's Bay.

Towards evening we arrived off the mouth of the Red River, which enters Lake Winnipeg by four or six distinct channels; the approach to the one by which we entered the river being marked out by buoys, on account of numerous sand-banks and shoals. The name of the river is described as being derived from a bloody combat between Indians, which took place on the borders of Red Lake; hence the name of the lake, which, being one of the principal tributaries of the river, gave the latter its name. Professor Hind describes the Red River as rising in Ottertail Lake, State of Minnesota. The north-east end of Ottertail Lake is in latitude 60° 24' 1", and the general course of the river is westerly, through an attractive undulating country, until it makes its great bend to the north in latitude 46° 9". It then meanders through a boundless prairie, which gradually declines in elevation, until it forms a vast level plain,

elevated above the water of the river only about one and a-half to two feet, at its ordinary stage, in June. The distance of this great bend is 110 miles from Ottertail Lake, and the vast low prairie through which the river subsequently flows, in an exceedingly tortuous channel, is as level as a floor. He makes the length of Red River within British territory to be 140 miles, by the winding of the stream. It debouches into Lake Winnipeg in latitude 50° 28', longitude 96° 50'. Its most important affluents on the east side are Roseau River and German Creek. On the west side it receives, in latitude 49° 53' 24", and longitude 96° 52', the Assiniboine, or Stony River. At the confluence of these streams, Fort Garry, the capital of the settlement, and the head-quarters of the fur-trade in British America, is situated.

The scenery at the mouth of the river was extremely dreary, the swamps on both banks being covered with reeds and rushes, which are inhabited by vast numbers of ducks, geese, bittern, plover, snipe, and other descriptions of game.

Having rowed up the river for fourteen miles, we camped for the night opposite the settlement of the Swampy Indians, distant about twelve miles from Lower Fort Garry, or the Stone Fort.

During the evening, Henry Prince, the loyal chief of the tribe, with a number of his warriors, came across the river to pay a visit to the commander-in-chief. They were dressed in full paint and feathers, and were armed to the teeth. After delivering a long-winded speech, professing the utmost loyalty on the part of his tribe to the Queen, their Great Mother, the Indian magnate and his young men withdrew, having obtained, as a reward for their loyalty, a barrel of pork and a barrel of flour.

We reached the Stone Fort next morning, 23rd August, in time for breakfast, and were most hospitably and kindly

entertained by Mr. Donald Smith, the Governor of the Company. As we neared the Stone Fort, the scenery became very pretty: farms and houses lined the left bank, which was rich prairie land, the right bank being thickly wooded. Crowds of Indians rushed out from their wig-wams and huts, and fired their guns in the air as a signal of welcome; the bells of the Protestant churches were rung, and every possible demonstration of welcome made by the settlers. In fact, the people seemed to understand readily that the expedition was—what it was meant to be—one of peace, not of war. They were overjoyed at the prospect of order and quietude, to which for a long time they had been total strangers.

On our departure from the Stone Fort, my company was chosen to form an advanced guard, which was to skirmish across the country, between the river and the road, to Fort Garry, 22 miles distant. It was to extend across the country for two miles, keeping well ahead of the boats, but always in communication with them by signallers. Mr. Butler, the intelligence-officer, was sent on horseback to examine the country on the right bank. He was rather unkindly described afterwards, in the report of the special correspondent of the Toronto *Globe*, as "being somewhere, "doing something for our security—we do not know "exactly what; but the idea of a man patrolling an "unknown country with a seven-shooting revolving-rifle, "gives his services great value in our eyes."

The rifleman's *forte* is certainly not riding; but whether he had ever seen a horse before, or not, was a matter of very slight consequence to Colonel Wolseley. A motley collection of horses, ponies, and mules, all more or less lame, halt, and blind, were brought in front of the astonished company, and the men told-off, as they stood in the ranks, to mount them. "Please, sir, I can't ride," said one man, imploringly. "I don't care a rap; get on to that mule!" said the colonel, pointing, as he spoke, to a half-starved-looking brute,

with a foal standing beside her. The unhappy rifleman approached the animal cautiously, and watching his opportunity, clambered on to its back, and, in company with the foal, took up his position in the ranks of the Light Cavalry!

Captain McCalmont, of the 9th Lancers, whom I mentioned as having come out from England to join the expedition, was now in his glory. Up to this time the work had not agreed with him so well as he expected; but he joined the troop of skirmishers with alacrity, and, armed with a huge cudgel, proceeded to set his beast in motion. Those who had been fortunate enough to secure animals equipped with saddle and bridle were few and far between, most of the company having to put up with an old blanket tied on with a piece of string, and a rope passed through the animal's mouth to serve as reins. Carts and light buggies were provided to carry the knapsacks and the men who were not mounted.

During the day, I was sent to the bank of the river to signal some message to Colonel Wolseley, and was accompanied by Captain McCalmont and the color-sergeant. Right across the country we galloped until we were suddenly stopped by a moderately-sized drain, at which we stared with consternation. "How were our gallant steeds to get over it?" was the question. "Stand back! I'll show you the way!" shouted the young cavalry-officer; and so he did—down one side and up the other—his example being immediately followed by the remainder of the party. We all went at the ditch in true hunting style, but the horses knew better than to take it in such. A bugler, in the execution of his office, came to untimely grief that day. Being ordered by the officer in command of the skirmishers to sound some call, he halted his pony, and proceeded to do so; but at the first sound of the instrument, the pony, unaccustomed to the noise, began to kick, and the bugler shot gracefully over his head, into a ditch close by. We had

orders to stop all communication between the Stone Fort and Fort Garry, and to make prisoners of every one coming from the latter place.

A gentleman connected with the Hudson's Bay Company rode from his residence, near Fort Garry, to meet the advanced guard, and, in a voice thick with emotion, bade us welcome to the territory. Having concluded his congratulatory speeches, he proposed to return, but was told he must remain where he was, and consider himself as under our care for the present. "All right, gentlemen," he said; "all right; if this is the way you treat loyally-disposed persons, I can only say I am very sorry. You have missed a good supper, though, in your readiness to consider everyone as an enemy; for on leaving my house, the last words I said to my wife were: 'Have a good supper prepared, with lots of beer and whiskey, as I shall bring back some of the officers with me!'" From the appearance of the gentleman, I should say he had had a similar repast before he started. As we rode past his residence, I thought it advisable to ascertain for myself whether he really lived there or not; and personal inspection proved that he had spoken the truth, both with regard to its locality and also the excellence of its malt-liquor. The appearance of my pony at the gate induced the other officers of the advanced guard to look for its owner, whom they fouud seated with his prisoner, discussing a modest quart. On leaving the house, we considerately allowed our friend to remain where he was.

When we had reached a point six miles from Fort Garry, we halted for the night. A camp was formed at the river-side, and the advanced guard stationed as an out-lying picquet on the prairie. Another out-lying picquet was stationed on the opposite side of the river. Everyone who came within the line of sentries was detained, and several of Riel's counsellors were made prisoners. One made a desperate effort to force the sentries and effect his escape, with the assistance of what he called his 2-40 horse; and

it was not until he was assured that the sentries had orders to prevent such attempts in an effectual manner that he promised to desist. All through the night the rain poured down; the picquet on the prairie, drenched to the skin, were huddled round their camp-fire, with no cover of any kind to protect them from the violence of the storm.

In the morning, at six o'clock, the boats were under weigh, rowing up the river in three columns, and the advanced guard resumed its skirmishing. The people we met gave us different accounts of the intentions of the Riel party in Fort Garry: some said he would fight to the last, and that he had fifty desperate men to aid him; and others thought he would run away at the last moment. The scouts brought in word that the guns in the bastions of the Fort were pointing down the road, in the direction we were expected to approach; that ammunition and muskets had been served out to those inside, and the gates closed.

When two miles, by road, from Fort Garry, the boats were left under the charge of the *voyageurs*, and the whole force landed. The guns were fastened to carts and dragged along, and, preceded by the skirmishers, the regular portion of the expeditionary force advanced in battle-array upon Fort Garry. As we approached it, several persons were observed hurrying off across the prairie, in buggies and on horseback, and all who came near us were detained. Every moment we expected the guns to open fire upon us, as we could see their muzzles pointing in our direction.

Staff-officers were sent to see if the gates were open, and galloped back to say they were, and that Riel and his warriors had bolted. With the band playing at our head, we marched into the Fort, and formally took possession by hauling the Union-Jack up the flag-post with three cheers for the Queen, and firing a Royal salute of 21 guns from the very cannon which had been loaded for our reception. Riel and his adherents had left the Fort immediately they saw us coming over the prairie, and had crossed the river:

their breakfast was left half-finished on the tables, and the general appearance of the rooms indicated that they had made a somewhat hasty toilet.

Our men were located in quarters lately occupied by the insurgents, and the officers took possession of the private apartments of the late self-constituted governor. Colonel Wolseley was entertained by Mr. MacTavish, the officer of the Hudson's Bay Company in charge of the Fort.

Fort Garry lies in latitude 40° 52' N., and 96° 53' W. longitude, and has an elevation of 700 feet above the sea-level. It is surrounded by high stone-walls, except on the northern side where a wooden wall, formed of large logs, laid one over the other, is built. The circular towers at the angles were occupied by small cannon, and in every room in the Fort muskets and ammunition had been stored away. On the opposite side of the river lies the Roman Catholic Cathedral, with its convent and palace of the bishop. Half-a-mile from the Fort lies the village of Winnipeg, from which numbers of people soon came to bid us welcome to the settlement.

The agricultural appearance of the settlement is remarkably pleasing and attractive, from the number of farms that have been laid out on the rich pasture-land of the prairie. Wheat is the staple crop, and the grain is of excellent quality. In favorable years wheat ripens and is ready for the sickle in three months from the day of sowing, which speaks well for the fertility and abundance of the soil. Several farmers, who had lived there for a long time, assured me that they could sow on their land for fifty years. Both hay and grass are easily obtained from the prairie; and hops, peas, potatoes and turnips, all grow well. Considerable quantities of sugar are made from the ash-leaved maple on the Assiniboine. The maple, which at one time grew in considerable quantities near Sugar-Point, on the Red River, is not the true sugar-maple (*acer saccharinum*) so common in Western Canada, but another species, also furnishing an abundance of juice, from

which sugar is made as far north as the Saskatchewan River. It is the ash-leaved maple (*regundo flaxinifolium*).—(General Lefroy.) Poplar, exceeding four feet in diameter, elm, exceeding three feet, and oak, of very large dimensions, are said to be the prevailing forest trees.

In the work compiled by General Lefroy, the half-breed hunters of the colony are thus described:—"These hardy "and fearless children of the prairie constitute a race to "which much interest may reasonably be attached. They are "endowed with remarkable qualities, which they derive in "great part from their Indian descent, softened and improved "by the admixture of the European element. It is, however, "much to be regretted, that, from the singular necessities of "their position, many of them are fast subsiding into the "primitive Indian state. Naturally improvident, and "perhaps indolent, they prefer the wild life of the prairies "to the tamer duties of a settled home: this is the character "of the majority, and belongs more to those of French "descent than of Scotch or English origin. The improvidence "of many of the half-breeds is remarkable, and many of "them can be regarded in no other light than men slowly "subjecting themselves to a process of degradation, by "which they approach nearer and nearer to Indian habits "and character, relinquishing the civilized but to them "unrequited pursuit of agriculture for the wild excitement "and precarious independence of a hunter's life. The half-"breed hunters, with their splendid organization when on "the prairies; their matchless power for providing themselves "with all necessary wants for many months together, and "now since a trade with the Americans has sprung up, if "they choose for years; their perfect knowledge of the "country, and their full appreciation and enjoyment of a "home in the prairie wilds, winter or summer, would "render them a very formidable enemy in case of disturbance "or open rebellion against constituted authorities.

"The half-breed hunters of Red River could pass into the "open prairies at a day's notice, and find themselves

"perfectly at home and secure, where white men, not "accustomed to such a life, would soon become powerless "against them, and exposed to continued peril."

Bishop Taché, in his sketch of the North-West of America, thus describes the prairie:—"The poor colonist who has "labored at clearing the dense forest-land of Canada, who "can only plant his land after a terrible struggle with the "giants that cover it, and after having dug it out to great "depths in order to extract innumerable enormous roots—he, "no doubt, naturally conceives a hatred for forest-land. He "has expended too much labour and exhausted too much of "his resources to believe in the superiority of this kind of "land. It appears to him that open country, where nothing "more is necessary, so to speak, than to put the plough in "the ground, is a fortunate country. From this point of "view, prairie has an unquestionable advantage; but as "nothing here below is perfect, the advantage has its "disheartening compensation in a very great scarcity of "timber and firewood. Time, far from bringing a remedy, "increases the evil. Fires, which destroy even forests, rob "the prairies of such small advantages as they may have in "this respect. I have crossed well-wooded districts, where "a few years afterwards I have suffered from cold, not "knowing wherewith to supply the smallest fire. The "conflagrations are more numerous in proportion to "the increase of travellers. They are becoming more "difficult to check as they find fuel in greater abundance, "and more combustible on the scene of their last "depredation.

"To the buffalo-hunter the prairie is a country without "equal. Winter and summer—there is his empire; there "he finds true happiness in urging his swift steed in pursuit "of prey, until recently so easy; it is there that, without "obstacle, and, so to speak, without labor, he lays out roads, "bounds over space, and enjoys a spectacle often grand, "although a little monotonous. Seen in the flower-season,

" the prairie is very beautiful, for its verdure-covered " ground is quite enamelled with different colors. It is a rich " carpet, of which the various tints seem to have been arranged " by the hands of an artist; it is a sea which, on the least " breath, undulates its scented waves. The plain, sometimes " so uniform as to shew an apparently artificial horizon, " suddenly changes into rolling prairie. Its beauty then " increases; a thousand little hills now raise themselves here " and there, and, by their almost regular variety, give the " idea of waves upon the ocean in the midst of a great " storm. It appears as if the powerful hand of the Ruler of " seas, mocking the fury of the waves, had seized them at " the instant of their rising, and, by a peremptory order, " changed them into solid land. In many directions, erratic " stumps, seen on the top of downs or hillocks, appear in " the distance like the petrified spray of foaming waves. " Elsewhere the prairie is planted with clumps of trees, and " dotted with lakes as pleasing as they are various in form. " Here are basins which one would say were the reservoirs " of great rivers, and of which the sides carry visible marks " of the levels once assigned by the Supreme Artist to these " dried-up ponds. Excepting the wild and rugged beauty " of large mountains; excepting the view of a great sheet " of water bathing a beautiful road-stead, and excepting all " natural beauty improved by the art, it is difficult to " imagine anything more beautiful, or, at least, prettier and " more lovely, than are some parts of the rolling prairie."

The Indians who frequent the Red River Settlement are composed, principally, of three tribes, namely: the Saulteaux, or Chippeways; the Maskegons, or Swampies; and the Crees. The Saulteaux derive their name from the Sault Ste. Marie, whence they originally came. They are fine, strong men, and fond of warfare. The Swampies are different: they are gentle, averse to bloodshed, easy to influence, and less superstitious. The Cree Indians consist of two tribes: the Plain Crees—warriors, and living in camps; and the Forest Crees—humble hunters and

fishermen, leading an isolated life. These two tribes speak one language. On the prairies, towards the Rocky Mountains, those fearful savages, the Sioux and the Blackfeet, are met with.

The regular troops remained at Fort Garry until August 29th, on which date the first detachment left the settlement, and proceeded home by the same route as on the advance. By the 3rd of September the militia regiments had arrived, and all the regulars were on the return journey. One company of the 60th Rifles was sent across the country to the north-west angle of the Lake of the Woods, and on arrival there took over the boats of Captain Scott's company of the Ontario militia, which had been sent there from Fort Francis.

The militia had done their work well, and had shewn that although most of them had started on the expedition as raw recruits, the pluck and spirit they were possessed of enabled them to do their share as creditably as the others. The future army of Canada will, indeed, be well supplied if it can number men in its ranks equal to the militia of the Red River Expedition.

In conclusion, I cannot do better than quote the General Orders published at Fort Garry by Colonel Wolseley:

"FIELD FORCE—MORNING ORDER.

"*To the Regular Troops of the Red River Expeditionary Force:*

"I cannot permit Colonel Feilden and you to start upon your return journey to Canada without thanking you for having enabled me to carry out the Lieutenant-General's orders so successfully.

"You have endured excessive fatigue in the performance of a service that for its arduous nature will bear comparison with any previous Military Expedition. In coming here from Prince Arthur's Landing, you have traversed a distance of upwards of 600 miles. Your labours began with those common at the outset of all campaigns—namely, road-making and the construction of defensive works. Then followed the arduous duty of taking the boats up a height of 800 feet, along 50 miles of river full of rapids and numerous

portages. From the time you left Shebandowan Lake until Fort Garry was reached, your labour at the oar has been incessant from day-break to dark every day. Forty-seven portages were got over, entailing the unparalleled exertion of carrying the boats, guns, ammunition, stores, and provisions, over a total distance of upwards of 15,000 yards. It may be said that the whole journey has been made through a wilderness, where, as no supplies of any sort were to be had, everything had to be taken with you in the boats. I have throughout viewed with pleasure the manner in which the officers have vied with their men in carrying heavy loads. I feel proud of being in command of officers who so well know how to set a good example, and of men who evince such eagerness in following it. Rain, too, has fallen upon 45 days out of the 94 that have passed by since we landed at Thunder Bay, and upon many occasions officers and men have been wet for days together. There has not been the slightest murmur of discontent heard from anyone. It may be confidently asserted that no force has ever had to endure more continuous labour; and it may be as truthfully said that no men on service have ever been better behaved, or more cheerful, under the trials arising from exposure to inclement weather, excessive fatigue, and the annoyance caused by flies. There has been a total absence of crime amongst you during your advance to Fort Garry; and I feel confident that your conduct during the return journey will be as creditable to you in every respect.

"The leaders of the banditti, who recently oppressed Her Majesty's loyal subjects in the Red River Settlement, having fled as you advanced upon the Fort, leaving their guns and a large quantity of arms and ammunition behind them, the primary object of the Expedition has been peaceably accomplished. Although you have not, therefore, had an opportunity of gaining glory, you can carry back with you, into the daily routine of garrison life, the conviction that you have done good service to the State; and have proved that no extent of intervening wilderness, no matter how great may be its difficulties, whether by land or water, can enable men to commit murder or to rebel against Her Majesty's authority with impunity.

"FORT GARRY, *August* 28*th*, 1870."

The return journey was, as the Colonel commanding predicted, successfully accomplished: the first troops reached Prince Arthur's Landing on September 26th, and the last on October 6th; and the whole were in Montreal by October 16th. The object of the Expedition had been accomplished, and order and tranquility restored in the Red River Settlement.

Paper VI.—RECREATIONS IN HISTORY.

By the LORD BISHOP OF QUEBEC.

(Read before the Society March 15th, 1871.)

I am afraid that the title of my paper is, in a measure, misleading. I am afraid that I may be considered to have held out the hope or the promise of recreation to you; whereas, all that I really propose is to tell you something about the way in which I procure my own recreation. This is, in fact, all that I can do; and ever since our late president did me the honour to ask me to read a paper before the Society, I have been casting about for a subject, without much success. The fact is, that mine has been but an old-fashioned education, such as was to be had before useful knowledge was invented; and lecturing comes hard to me. However, I have undertaken to read a paper before you; and in fulfilment of my promise, I will now proceed to sketch the manner in which I have been used to seek my recreation in history.

It has always given me more delight to catch my glimpses of history by peering through the cracks and chinks of the material than I could obtain by looking through the window held open by the historical showman, and, I think, as much instruction. In plain words, I find more pleasure, and more success, in calling up the life of the past, by studying such bits of contemporary evidence as are within my reach, than by passively absorbing the narrative of compilers. Glimpses of history are, of course, all that most of us in this way can get; for bits of evidence are all that we have the means of investigating. A thorough knowledge of history we can only have by a thorough knowledge of all the contemporary sources of history; and this belongs to the opportunities and the abilities of a few. Very thankful we are, and must be, to read their fine and flowing tale; but the storing-up of this in the memory is not a knowledge

of history. We cannot be sure of the facts till we have read at least the writings of two historians taking opposite sides—or, at any rate, till the narrative we follow has been subjected to keen and competent criticism. And the facts, when we get them, uncoloured by the writer's opinions of motives, characters, and causes, are but bare and meagre husks. The colouring and complexion—the flesh and blood with which Macaulay or Hume clothes this lifeless skeleton—the informing-spirit which they breathe into it,—all this is the creation of their own minds—the result of their own inferences—the reflection of their own capacities, tastes, and predilections. How much so, the different ways in which different men of equal ability and equal honesty represent the same events, or course of events, will sufficiently prove. Their narratives are delightful and instructive so long as they are taken for what they are; they are misleading and deceptive when they are taken for what they are not. Now, we are not all qualified to pronounce upon the accuracy of these men in all the particulars they relate; but we can qualify ourselves to read their works without having our wits run away with. And before going further, I will point out how necessary it is to be on our guard against errors of fact in our most trusted historians.

Macaulay, as is well known, painted a not very flattering portrait of William Penn. This he founded, in great part, upon some discreditable transactions respecting the sale of pardons after Monmouth's rebellion. These, at any rate, were the facts, or seeming facts, which threw the blackest shades upon Penn's fame, and seemed to justify, beyond cavil, the historian's disparaging estimate of the man. But it turns out that the real offender was another man—one George Penn. This, however, is by no means the worst of the matter. It appears to have been Sir James Mackintosh who made the mistake; and Macaulay, taking his blunder without verification, adopted it as his own. And this is what, more or less, discredits all historians—second-hand information doing duty for original research.

I cannot at present lay my hand upon my authority for this correction; but I well remember seeing it in the criticisms and discussions which followed upon the publication of Macaulay's history. I believe Macaulay never owned that he was wrong; but that does not make him right.

I will now take another case, in which the same historian's bias and predilection made him—not suppress anything, certainly, but—so state and paint some things as to make them not very visible. Macaulay adored William and hated James. Now, there is the same blemish in the life of each. Each was married to a young and beautiful wife, and each neglected her; and Macaulay tells the fact in regard to each. But I will venture to say, that everybody who has read his history has James's fault ringing in his ears; but that most, if they have not been reminded from other sources, have forgotten all about William's failing. So much for what a popular writer calls "the way of putting things."

And, if I do not weary you with these animadversions, I will now take another admirable writer, who has established for himself a name of great authority, by his brilliance of style and his reputation for research, and shew him in his weakness. But before I go on to criticise his accuracy and reliability, I must, in passing, since I have mentioned it, say just one word regarding the style of Mr. Froude. It is not faultless; but it is beautiful—far better, in my judgment, than that of Macaulay, which, masterly as it is, has, with all its unvarying clearness and force, an artificial and rhetorical ring that—lowers it, shall I say?—or elevates it into mannerism. An admirable manner it is, no doubt, but still a manner, something unique. If you or I were to try to write like Macaulay, we should seem ridiculous. If we could write like Froude, it would only seem that we wrote uncommonly well. That is his charm, his naturalness. There is no affectation of fine writing, though there is plenty of it. Always the style rises and falls with spontaneous flow. His eloquence comes of the

passionate feeling which the course of his narrative has kindled within him; and when he is picturesque, it is because the scenes he describes rise vividly before him. When his diction is most polished, you can see no mark of the file. What could excel, for instance, the felicitous touch and graceful keeping of his picture of the attack upon Leith, where, after telling the story of the unsuccessful assault, he concentrates his description into a single image of matchless beauty, and, coupling to it a touching incident, holds it out before us, luminous in the light of a dramatic sympathy? A few lines—a couple of sentences—and the scene is imprinted upon the mind for ever:

"The dying Mary of Lorraine had been carried from her "bed to the walls of the castle, to watch the fight. As the "sun rose out of the Forth, she saw the English columns "surge like the sea-waves against the granite ramparts, and, "like the sea-waves, fall shattered into spray."

But this by the way. What I intended, when I brought in Froude's name, was to criticise his accuracy.

In his seventh volume, page 479, he says:—"On the 12th "of January parliament opened, and with it the first "convocation of the English Church. The sermon at St. "Paul's was preached by Nowell, the Dean; that at "Westminster by Day, the Provost of Eton. The subject of "both was the same, the propriety of 'killing the caged "wolves'—that is to say, the Catholic bishops in the Tower, "with the least possible delay."

In a note he gives his authority, and adds, as from the melancholy musings of his own saddened mind: "It is mournful "to remember that Nowell was the author of the English "Church Catechism in its present form." I read this with astonishment. How anybody could call Nowell the author of the English Church Catechism in its present form, it passed the powers of my imagination to conceive. "In its present form":

there was an air of preciseness and authority about that phrase that perplexed me. That Nowell wrote a Catechism, I well knew. But that was a very different affair. It is a long treatise, written in Latin, containing 125 closely-printed octavo pages—which, certainly, is not the Church of England Catechism in its present form. The source of the error was not, however, far to seek. The author of the English Catechism in its present form was a Dean of St. Paul's—Dean Overall—Nowell's successor, who wrote the last part relating to the sacraments. Here was the mistake: Nowell, Dean of St. Paul's, wrote a catechism; a Dean of St. Paul's is the author of the English Church Catechism in its present form; therefore, Nowell is the author of the English Church Catechism in its present form. This is the style of reasoning called by somebody—Locke, I think—"seeing a little, presuming a great deal, and jumping to a conclusion." The mistake might have been pardonable in some men; but in one of Mr. Froude's antecedents, ignorance of such matters did seem strange. It was not, however, till some time after that I fell upon a passage throwing light upon the matter. Consulting, one day, Shepherd's "Commentary on the Common Prayer," I found that Gilpin, in his lectures, had spoken of Nowell's book—confounding it, apparently, with older editions of the Church Catechism—as our Catechism, "nearly in its present form." Froude, writing from his recollection of this or some similar statement—this very one, I should think—drops out the "nearly," and says, "in its present form"—absolutely evacuating the looser statement of whatever ground-work of truth it may have contained, and incorporating his own residuum of pure, unmitigated error into a sigh for human frailty, which is, under the circumstances, touching;—a slight and unimportant matter this, in itself, but significant as revealing the historian's habits of composition and the value of his assertions.

These instances illustrate, I think, sufficiently, the necessity of some verifying process to which historical compilations may

be subjected. One, and, of course, a very valuable one, is the sieve of hostile criticism. We should hear the other side. The plan I wish to speak of is not so extensive and exhaustive; but, so far as it goes, it is a still more satisfactory one.

And in order to open it, let me illustrate for a moment from another branch of knowledge. Suppose a man to master the best manuals of geology—to be thoroughly conversant with all its accepted facts and principles;—suppose him to be able and accustomed to follow intelligently the reasoning of the theorists and investigators, who, from time to time, propound new views and fresh applications of the science: well, he has that in his head which is a great deal better than emptiness; but, still, it is only information; it is not knowledge—at least it is other people's knowledge, not his own. But suppose that he is used to go into the quarries, and along the rocks, hammer in hand, and to search and to see whether these things be so: he will then get a knowledge of a different sort. So far as he is an original geologist, he will know these things as he could not know them from books; and he will get a higher and better standing-ground from which to view the information which he receives from the researches of others. His mind, so stimulated and educated, will develope a faculty which will transmute information into knowledge.

And, here, I must illustrate my illustration:—In the familiar process of brewing, we know that the barley must be converted into sugar. This is done in the malting. All the farina, however, in the barley, is not in malting converted into sugar; but a certain substance, called diastase, is evolved, which, at a certain temperature, will convert the rest of the farina—and, for that matter, a large quantity of unmalted barley besides.

Now, this transmuting power is just what original investigation developes in the mind. A mental diastase is

evolved. The more original research there is the better; but even a little goes beyond itself in the mental habits it creates, and has a very mellowing effect upon the information which we obtain from the observations and reasonings of others. And as in science, so in history. By questioning and sifting the monuments and remains of other times for ourselves —the ruined walls—the incidental and undesigned notices of literature—any fragments of contemporary thought and activity—we can call up some portion of the past; and this knowledge, however scanty, will be true and real knowledge, and will help us, moreover, to read between the lines of the narrative or compilation we may have in hand.

Contemporary historians, such as Clarendon or Thucydides, will, of course, be seized with avidity by one willing to know the times of which they treat, when they are to be had. And for their command of current knowledge, and their presentation of society in its outward aspects, they are invaluable. They may have a true and penetrating insight into its inner spirit—into the characters of men, and the tendencies of events; but they may not. The influences of the age are upon them; and they may view men and measures through the discoloured and distorting medium of party feeling. Still, even in its defects, if intelligently studied, contemporary literature is always instructive; and, until we have walked some way in its light, we can have no conception "how far that little candle throws his beams." When I read Livy, I read a romance; when I read Niebuhr, I read another; but when I get hold of the satires of Horace, or the letters of Cicero, then old Rome lives around me. I am amongst the men themselves. Their ambition, their successes and failures, their public sentiment, and their domestic manners, disclose themselves with all the charm of truth and unconsciousness in every page. I am present at the Roman gentleman's levee at early dawn. I attend him to the forum. I mark the humours of the sovereign people. I see the knots of bankers and men

of business discussing their affairs; witness the trial of a pro-consul for the oppression of a province; or hear Cicero address the people for the promulgation of a law. Or, turning in another direction, I stumble against Horace taking his customary stroll along Holy-street. I accompany him, as he saunters through the fruit-market, or looks on at the tricks of the jugglers; or I listen to his chat about the weather and the prize-fight, as he rides in his patron's carriage. In the afternoon and evening I sit with these people at their entertainments; watch their enjoyments; and listen to their jokes. The busy and the idle, rulers of men and unappreciated poets, pedants, and epicures, all pass before me; and I see them with my own eyes, and hear them with my own ears, as I can see them with no other man's eyes, and hear them with no other man's ears—see them in their undress—hear, not the sonorous roll only of the orator's flowing periods, decorous with sentiment suitable for the occasion; but hear him brag of his performance afterwards to his friend.

And something more than mere amusement comes of this poring over these old illustrations of by-gone manners. There is a collection extant of some 122 letters, mostly very short, which passed between Pliny and the Emperor Trajan, relating to the administration of the province over which Pliny presided. One of these gives an outside view of Christians and the Christian religion, very interesting to us.

Though he felt bound to punish the Christians as an illegal sect, Pliny, after careful enquiry, confesses that the sum of their offence was, "that on a stated day they were accustomed to assemble before day-light, and to sing among themselves, verse and verse about, a hymn to Christ as to God; and to bind themselves by an oath (sacrament) not to the commission of any crime, but that they would be guilty of no robbery, no breach of the marriage vow, no breach of trust; after which their custom was to disperse, and again to meet, in order to

partake of a common and harmless meal." To us, who can read between the lines, how much that simple statement means. And then the wide extent to which Christianity had spread, not in cities only, but into villages and country places, is noticed. And that old letter stands an imperishable monument of the purity of the early Christians' lives, and an unassailable witness to the broad simple outlines of their faith and worship.

Now, this home-brewed history, which we extract for ourselves, is, I maintain, the very best that we can have. And we can have it in abundance. Not even the re-opened streets and houses of Pompeii, where we look in upon the habitations of the old Romans just as they left them, nearly 1800 years ago, give a more adequate picture of old Roman life than that which rises to the eye, which has been trained by observation and thought to look with discriminating and constructive vision upon the letters, the poems, the fragments and remains of the old Roman mind.

Since I have mentioned Pompeii, I must say a word about it. Very much can be seen there, no doubt; and those are fortunate who can see it. There is to be seen the eating house, just as it was left, with its marble slab, on which the smoking meats were exposed; its iron cooking-stove; its jar of wine, which had been 32 years in bottle; its oven, containing 83 loaves, just like the modern double loaf, scored at the top, and so on. There are still the election-placards on the walls. "Vote for Capella!" writes one enthusiastic supporter of that gentleman; and another, of the opposite party, I suppose, curiously chronicles the antiquity of log-rolling. One of those incorruptible electors is asked to vote for Sabinus, and Sabinus will vote for him. There, too, is the inn with the sign of the elephant. And there is his Greek alphabet scratched on the wall by the small boy, who could not lift his little hand above three feet from the ground.

And here is an affecting picture, which I take, as I do all this account of Pompeii, from the "Quarterly Review," April, 1864:

"At some distance from this group lay a third woman. She appears to have been about twenty-five years of age, and to have belonged to a better class than the other two. On one of her fingers were two silver rings, and her garments were of a finer texture. Her linen head-dress, falling over her shoulders, like that of a matron in a Roman statue, can still be distinguished. She had fallen on her side, overcome by the heat and gases; but a terrible struggle seems to have preceded her last agony: one arm is raised in despair; the hands are clenched convulsively. Her garments are gathered up on one side, leaving exposed a limb of beautiful shape. So perfect a mould of it has been formed by the soft and yielding mud, that the cast would seem to be taken from an exquisite work of Greek art. She had fled with her little treasure, which lay scattered around her—two silver cups, a few jewels, and some dozen silver coins. Nor had she, like a good housewife, forgotten her keys—after having probably locked up her stores before seeking to escape. They were found by her side."

Well,

"*Non cuivis homini contingit adire Corinthum.*"

We cannot all see these things for ourselves. Nor can we see the tombs at Thebes, where the old Egyptian life is depicted with such wonderful fidelity; but the remains of antique life, which are entombed in literature, are more accessible. And, though I am lingering too long, perhaps, upon this subject, there are a couple of letters from that same Pliny, whom I have before quoted, to his friend Tacitus, the historian, descriptive of the eruption of Mount Vesuvius, by which Pompeii was destroyed, to which, before passing to other matters, I should like to refer, both because the letters

are so interesting in themselves and because they afford so excellent an illustration of the historical value of private letters and contemporary evidence, upon which I am insisting. In them we see the event with the eyes of an eye-witness. Pliny was at Misenum, the north-western extremity of the Bay of Naples, with his uncle, Pliny the naturalist, when, on the 24th of August, early in the afternoon, his mother came to tell his uncle, who was lying down and reading, that a strange appearance was visible in the sky. The old man called for his shoes, and ascended an eminence, from whence he could obtain a better view of the phenomenon. He saw a cloud, in shape like a pine-tree, with its lofty spiral trunk and drooping branches—brilliantly white at first, and then changing to a stained and dirty colour. The man of science, with his thirst for observation, would make a closer inspection. He ordered out a light, swift craft, to cross the bay, and offered to take his nephew, the writer, with him; but he, wishing to continue some study in which he was engaged, preferred to remain at Misenum; and the old man went off, with his note-book in his hand. He landed at the house of a friend, near Stabiæ, where the danger, though imminent, was not immediate. The quiet calm with which he took his dinner and lay down to rest, reassured the panic-stricken household. After he had been sleeping some time, the ashes fell so thickly that if he had not been roused from his slumber the passages leading to the room where he slept would have been blocked up, and his escape cut off. All now sought the open air. Though still daylight elsewhere, it was dark as night with them. They walked toward the shore; but the suffocating vapours were insupportable. The old man lay for some time on a piece of refuse sail-cloth. The rest fled. He called, more than once, for cold water, and drank. Then he tried to rise, leaning on two slave-boys; but again he fell. And after three days, during which the eruption appears to have continued, his body was found in the quiet attitude rather of repose than of death.

In the meanwhile, his nephew, then in his eighteenth year, continued at Misenum. In the course of time, the danger approached. The island of Capreæ could no longer be seen, and the promontory at Misenum itself was hidden. Then all fled. But the blackness, more than of night, overtook them. The trampling rush of the terror-stricken crowd, the shrieking of the women, the wailing of the children, and the shouting of the men, the confusion and the sorrow, are all told to the life. And in the midst of it all, we see the touching picture of the mother urging her son to escape, in the strength of his youth, and leave her to die alone; and the son, steadfast not to live unless she lived, taking her by the hand and leading her, still chiding, because he will not leave her and save himself, with gentle force, unwillingly, away.

To pass now to our own history. In the pages of Froissart (of whom there is an admirable copy in your library, in the quaint translation of Lord Berners, made in the time of Henry VII., appropriately antique in its diction, but not too much so to be easily read,) we have our ancestors of the time of Edward III. brought before us, in all the pomp of their chivalry, by one who had lived amongst them. Those enchanting stories constitute one of the most precious monuments of the middle ages; and by the perusal of them, we can compose our own historical novels, better and truer, for ourselves at least, than any that the most gifted genius can write for us.

A picture, too, has been left us of the same time, or a little later, by another great painter of contemporary manners. Chaucer, in the compass of some 900 lines, which form the prologue to his Canterbury tales, has left us what may be called a photograph of the 14th century. The knight, the squire, the monk, the nun, the begging friar, the serjeant at the law and the doctor of physic, the Oxford scholar and the poor parson of a town, with the shipman, the ploughman, and mine host of the Tabard, in Southwark, where the company assembled before they set out on their pilgrimage to

the shrine of Thomas-à-Becket, are all introduced to us with minute and felicitous descriptive touches. It is impossible to pass through this gallery of portraits without being convinced that they were drawn from the life, and that they were intended to constitute a picture of society at the time. As they ride together, we see the mingling of many ranks; and as we listen to their talk, we note how they bore themselves one to another. *Old* England lives, moves, and speaks around us.

If we now come down into the 15th century, another view of our forefathers and their fashions is opened to us in the Paston Letters. These extend over the last half of the 15th century, being a family correspondence; and, in many significant facts, they disclose the manners of the day; not the least striking feature in which is the strange absence or quiescence of the law. And, indeed, from what we do see of the law, its absence was perhaps as beneficial as its presence. It seems to have been a not unusual practice to push legal processes in a secret and clandestine manner, without letting the parties most concerned have any knowledge of the same till the case had gone against them. And there were strange ways, too, for men of influence to avoid the inconvenience of an adverse decision. Here is an extract from a letter dated 1440:

"Be ye remembered that an Esquire of Suffolk, called "John Lyston, hath recovered in assize of novel dissension "700 marks (£466 13s. 4d.) in damages against Sir Robert "Wingfield."

And what did Sir Robert do? Pay it? Not a bit.

"In avoidance of the payment of the said 700 marks, the "said Sir Robert Wingfield, subtely, hath outlawed the said "John Lyston in Nottinghamshire; by the virtue of which "outlawry, all manner of chattel to the said John Lyston "appertaining are accrued to the King. And anon, as soon "as the said outlawry was certified, my Lord-Treasurer

" granted the said 700 marks to my Lord of Norfolk, for the " arrears of his pay whilst he was in Scotland ; and according " to this assignment aforesaid, tallies were delivered. And " my Lord of Norfolk hath released the same 700 marks to " Sir Robert Wingfield."

It will sufficiently appear from this, I think, that our ancestors were at least equal to their posterity in the manipulation of a job.

These Pastons had a dispute with my Lord of Norfolk, in regard to the possession of a house and estate. The Pastons were in possession, and Norfolk's men laid regular siege to the house. His mother writes during the siege to her eldest son, to stir him up to a sense of his duties as head of the family.

" I greet you well," she writes, " letting you weet that your " brother and his fellowship stand in great jeopardy at Caister, " and lack victuals, and Daubeney and Berney (two friends " who had joined him in the defence) be dead, and divers " others greatly hurt, and they fail gunpowder and arrows, " and the place is sore broken with guns of the other party ; " so that, unless they have hasty help, they be like to lose both " their lives and the place, to the greatest rebuke to you that " ever came to any gentleman, for every man in this country " marvelleth that ye suffer them to be so long in great " jeopardy without help or other remedy."

It appears, from the answer to this letter, that impecuniosity was an affliction which our forefathers suffered in common with ourselves. Indeed, bad as times are, they were in worse case ; for here is a gentleman attending the court, and associating intimately with the first of the land, carrying on a little private war on his own account, who writes :—" By my troth, I have but ten shillings, and wot not where to have more ; and, moreover, I have been ten times in like case, or worse, within these ten weeks." Norfolk's men ultimately got possession of the place. These are by no means the

most striking passages of the letters; but as I am now unable to refer to the book, I have been obliged to borrow the first extracts that came to hand.

A series of the private letters of a considerable family, extending over 40 years, must needs open up many interesting views of domestic life and of public affairs; but these incidental and undesigned revelations come upon us from all sides, when we have the habit of observing them. Even sermons tell us a good deal. Those of Latimer teem with illustrations of the state and manners of his time. And here is a picture of Cambridge life, in a sermon preached before the University (portions of which are preserved in Strype's memorials), by Thomas Lever, fellow of St. John's College, in 1550, in considerable contrast to what is to be observed in that seat of learning now:

"There be divers there," he says, "which rise daily about four or five of the clock in the morning; and from five to six of the clock use common prayer with an exhortation of God's Word in a common chapel; and from six until ten of the clock use either private study or common lectures. At ten of the clock they go to dinner, whereas they be content with a penny-piece of beef among four, having a few pottage made of the broth of the same beef, with salt and oatmeal, and nothing else. After this slender diet, they be either teaching or learning till five of the clock in the evening, wheneas they have a supper not much better than their dinner. Immediately after which they go either to reasoning in problems or to some other study, until it be nine or ten of the clock; and then, being without fires, are fain to walk or run up and down half an hour to get a heat on their feet, when they go to bed." They have changed all that now.

Coming down a little further, we encounter Bacon's mother, who was a learned, pious, shrewd woman; and she writes a capital letter. A capital manager she was, and very ready to manage—a little too much so, perhaps—sending

up to her sons from Gorhambury barrels of beer, and good advice, with an occasional dash of sarcasm. There is a vigour and a downrightness in her letters—a worldly wisdom, coupled with womanly piety, which make them always of the raciest. And when we remember that she was the widow of the Lord-Keeper, Sir Nicholas Bacon, and that her sister was the wife of the great Burleigh, we understand that as we read we are entering into more familiar acquaintance with the great people of a great period. Here is a specimen of the way in which she writes to her sons, who seem to have been inclined to cut a dash:—"I am sorry your brother and you charge yourselves with superfluous horses. The wise will but laugh at you both; being but trouble, besides your debts, long journeys, and private persons. Earls be earls. Your vain man, straitly, by his sloth, and proud, quarrel-picking conditions, sets all your house at Redbourn out of quiet order, by general complaints, as I hear. Lately, young Morer was smote in the eye by him. And I pray God you hear not of some mischief by him. But my sons have no judgment." And here is more advice of a different sort: "The two countess sisters will neighbor you; both ladies that fear God and love His word—indeed zealously, specially the younger sister. Yet, upon advice, and some experience, I would earnestly counsel you to be wary and circumspect, and not to be too open, nor willing to prolong speech with the Countess Warwick. She, after her father's fashion, will search and sound, and lay up with diligence, marking things which seem not courtly; and she is near the Queen, and follows her father's example too much in that." And these letters are none the more interesting now, from the frequent injunctions with which they are interspersed, such as

"Burn, I pray, but read well first."

Descending, now, to the next generation. One of the best of letter-writers was James Howell, who was born in 1596 and died in 1666—though the fact that his epistles were designed for publication, robs them of a good part of the

charm they would otherwise have. He was one of 15 children, the son of a Welsh clergyman, educated at Oxford; engaged abroad in commercial pursuits and in public employment; going secretary to Lord Leicester in Denmark; made clerk of the council in 1641; imprisoned in the fleet in 1643, as a malignant; and being, as he was, in constant correspondence with men of all ranks, he necessarily reflects in his letters the times in which he lived; and this he does with an ease, wit, and skill, which endow his epistles with an enduring fascination. I have given away my copy, which I used for several years, and am, therefore, unable to make any extracts; but I can assure you that there is good history in his book, and pleasant reading. And there is no lack of writers, easily accessible, who depict these times from their own observation.

The England of Charles I., the Commonwealth, and the Restoration, is nowhere better seen (that part of it, at least, which is shewn) than in the life of Anthony à Wood, the Oxford antiquary, written by himself. I had intended to give some extracts, descriptive of the fighting between the Cavaliers and Roundheads, some of which Wood saw with his own eyes, when a boy at school, at Thame, in Bucks, and of the state of society in Oxford in his day; but I must put these aside, and confine myself to one single extract, which will serve to shew how much more a simple, unadorned, but very significant fact, is to be learned from such books than from the historian's narrative; and how much more plainly facts speak for themselves than do the generalizations and reflections men make upon them. When the war between Charles and the Parliament began, "upon the first news at Oxford that the armies were going to fight, Mr. Wood's eldest brother, Thomas, left his gown at the town's end, ran

to Edgehill, did his Majesty good service, returned on horseback, well accoutred, and afterwards was made an officer in the king's army." After the final defeat of the king's party he returned to Oxford, where, being involved in a projected royalist rising, which was discovered, he fled for his life, and joined Cromwell's army in Ireland, in which he rose to the rank of major. The atrocities perpetrated by this army in Ireland are well remembered by the Irish. And I do not say that English historians pass them over; but a generalized condemnation of undue severity, or a lament over the license of war, does not shew us the thing, or make us feel as we ought to feel about it. This brother of Anthony à Wood was present at the taking of Drogheda; and it is worth our while to see if just a single incident that he relates does not throw more light upon the matter than we get from our histories. In the voluminous pictorial history of England thus much is said about it:

"Drogheda was stormed on the 11th of September, Cromwell "himself fighting in the breach. In the civil war in England "he and his men had ever been merciful to the vanquished; "but here, and everywhere in Ireland, little or no mercy was "shewn to the Papists or idolaters."

Hume says something more. After describing the assault, he goes on to add:—"The town was taken sword in hand; "and orders being issued to give no quarter, a cruel "slaughter was made of the garrison. Even a few who "were saved by the soldiers, satiated with blood, were next "day miserably butchered by order of the General." Bad enough, that. But you observe that only the garrison, the fighting men, are mentioned;—not a hint is there that any of the inhabitants were ill-treated.

Now, listen to what Thomas Wood told his mother and his brother:—"He told them that when they were to make their way up to the lofts and galleries in the church, and up to the town, where the enemy had fled, each of the assailants would take up a child and use as a buckler of defence when they ascended the steps, to keep themselves from being shot or brained. After they had killed all in the church, they went into the vaults underneath, where all the flower and choicest of the women and ladies had hid themselves. One of these—a most handsome virgin, arrai'd in costly and gorgeous apparel—kneeled down to Thomas Wood with tears and prayers to save her life; and being strucken with a profound pity, he took her under his arm, and went with her out of the church, with intentions to put her over the works to shift for herself; but a soldier perceiving his intentions, he ran his sword through her body; whereupon Mr. Wood, seeing her gasping, took away her money, jewels &c., &c., and flung her down over the works." That is the sort of thing that has made Ireland a difficult country to govern.

"The evil that men do lives after them."

I fully intended, when I began to write this paper, to have been rather large in my illustrations from the diaries and correspondence of Eveleyn, where the ways and feelings of the time are so finely portrayed; but above all, from the diary of the vain, the shrewd, the honest, the naive, the ever-amusing, the incomparable Samuel Pepys, to open whose book is to do nothing less than to step back into the times of Charles and James, and, unseen, ourselves to mingle with the motley crowd; but I have left myself no time for this. And it is the less needed, as the book is so popular and so accessible.

The literature of the stage, too, and of fiction, which has for its office to "catch the living manners as they rise," would be of great service to one endeavouring to reproduce the past. It is only to name the name of Mr. Justice Shallow, and country life in England 300 years ago comes back at the sound. It is put further back in the play; but the life depicted is the life that Shakespeare saw. It comes back in the conversation of country gentlemen, and their talk of sheep and of bullocks and of rural sports. They re-appear before us—the silly squire with his weak and wicked boastings of youthful follies, of which, if they were not lies, he ought to have been ashamed, and his moral prattle, and his justicing; and his pippin of his own grafting; and his cousin, the neighbour justice, whose son William is at Oxford still, to his cost; and old Double dead at last—old Double, who drew so good a bow, and of whose skill all the country-side was proud. And, to take another example, Lord Foppington, when he announces that "to mind the inside of a book is to entertain oneself with the forced products of another man's brain,—now, I think, a man of quality and breeding may be much amused with the natural sprouts of his own," serves to remind us that the race of puppies is perennial.

And there is another book, too, of infinite value for building up the structure of a bygone age, to which, though space will not permit me to illustrate from it, I must refer you—and that is "*Howell's State Trials.*" I do not know whether it is, but it certainly ought to be, in your library. Always the records and incidents of courts of justice preserve authentic monuments and enduring fragments of the past. Go back as far as we will, if we can but get into court we are transported into the very times of which we read. When

we stand within the charmed circle where Demosthenes pleads for the honours and immunities of his friend, as he calls his evidence and cites his authorities, we are in the very tide and flow of Athenian life. Their trade and their finance; where they got their corn and how they raised their taxes—the place rings with it. Their customs are around us: we walk amid their usages, and we breathe an air charged with the public sentiment of the time. And when we listen to Raleigh, as, in Winchester Castle, from eight in the morning till eleven at night, he confronts his accusers and baffles the vulgar violence of Coke, our mind's image of this "courtier, soldier, scholar, all in one," is no longer the reflection of a reflection—the faint or faulty projection upon our apprehension of another man's notion, but the direct impression printed upon the tables of our brain by the very presence and bearing of the man himself.

In this manner, by bringing our minds into close and actual contact with the authentic monuments and genuine fragments of the days that are gone, we shall (if I may venture, without irreverence, to appropriate the prophet's imagery) reanimate and re-people that valley of dry-bones which we call history. Under the re-creating force of thought, there will be a shaking, and the bones will come together, bone to his bone; and the breath will come from the four winds, and breathe upon them, and they will live.

Well, then, if this is the fruit of applying our mind in the direction I have indicated, what shall we say of it? I think we may say that it is a very pleasant fruit. I, for my part, enjoy the flavour of it. I enjoy it; and there

is no reason why I should not. Rather there is every reason why I should, for it is a very wholesome fruit. The mind grows and increases in strength, stature, and suppleness, by feeding upon it. And this growth and development, in faculty and capacity, is no inconsiderable result. It is, of itself, the worthy and sufficient end and justification of intellectual effort. But it is not the only result. To train ourselves, as we direct our thoughts back upon the past, not idly to gaze upon "authorized romance," impalpable abstractions, barren generalities, truisms that never kindle into truths, and facts that have neither voice nor utterance; but in such manner "to hold the mirror "up to nature as to shew virtue her own feature, scorn her "own image, and the very age and body of the time his form "and pressure," is to learn to look through the "dry light" in which the secrets of truth are visible—to discern the "veiled "hand that guides the world," and to recognize the laws that regulate the progress of mankind. And when we have attained to that, history will be to us something better than an old almanac.

Paper VII.—ENGINEERING AND ENGINEERS.

By Lt.-Col. B. H. MARTINDALE, C. B., *Deputy-Controller, Associate Institution Civil Engineers, and Member Institution Mechanical Engineers.*

(*Read before the Society April 12th*, 1871.)

"Engineering is the art of directing the great sources of power in nature, for the use and convenience of man." So said Thomas Telford, the eminent Civil Engineer, just 51 years ago, when, as first President of the Institution of Civil Engineers, he delivered his inaugural address. So, with even greater justice and honest exultation, may the Engineer of the present day exclaim, looking back at the mighty strides which science has made in the last half-century, and on the amazing results which surround us.

So numerous, so vast are those results, that we are fairly staggered with the magnitude of the subject as we begin to recall them. They meet us at every turn of daily life, and fill us with ever-fresh surprise at the powers which the Divine Creator has hid in nature, and at the ability with which He has endowed man to develop those powers.

In peace and in war, in our quiet homes and in the rushing travel of the day, on land and at sea, we meet the Engineer, and enjoy daily a thousand advantages and comforts from his skill and labor. The lighthouse which welcomes us as we approach the land; the breakwater which secures the anchorage; the quays and wharves at which the ship, itself of iron curiously wrought together, unloads; the engines within it, so mighty as to be capable of urging the mass, weighing thousands of tons, against the storm and over the ocean to the appointed post, and yet so delicately made that a bearing scarcely heats, and that the touch of a finger can govern the whole; the motive-power of water so combined with heat as to create steam—a power so terrific, that uncontrolled it can shatter into fragments the vast

fabric which it is made to move, and yet so exquisitely controlled as in its use to prevent the very evils that would neutralize its power, and, as in the locomotive, to fan the flame that, fanned, creates fresh steam; the railroad, which, diminishing distance in proportion as time is saved, bears along that ever-increasing freight, and those ever-increasing myriads which no other known means of communication could have borne, carries the weary man of business and the toil-stained mechanic daily from the smoky stifling town to the clear invigorating country, or the eager traveller from the ship to his expectant home, to which his approach has already, swiftly as by lightning, been made known by the "winged word" which electricity speeds over the earth and under the sea,—one and all of these reflect the Engineer; while that home itself, lighted with gas, supplied with water, and warmed, ventilated, and drained, presents ever-present proofs of what we owe to science, and speaks of labor and discoveries not less real, if less striking, than the steamer, the railroad, and the telegraph, and certainly not contributing less to our daily comfort and increasing health and power of life.

Or if we turn to war: those fortresses which enable the defenders of a country to resist the attack of a superior force; those torpedoes and submarine mines which defend its shores and rivers; those huge guns, 35 tons in weight, carrying a missile of 700 lbs. in weight a distance of six English miles; the improved missiles themselves; those great plates of iron so craftily bolted together as almost to defy even such missiles; those cunning and yet simple rifles, breech-loading, deadly at 1000 yards in skilful hands; those adaptations of light, of signals, and of electricity, for instant communication to troops scattered over long distances; those most ingenious means of ascertaining the velocity with which the projectile leaves the gun from which it is fired, and of ascertaining the disruptive force of the powder when fired upon the gun itself; those carriages in which the very recoil of the gun is made of use to cover the gun

out of sight of an enemy,—these and many other such-like things, among which may be mentioned the balloon, pressed into the service, present to us the Civil, the Mechanical, and the Military Engineer, combining with the Artilleryman in labors honorable to themselves and useful in the highest degree to their country.

Or, returning to the wants of peace: in the canals and locks which evade the rushing rapids, and turn the flank even of Niagara; in the improvement generally of internal navigation; in the drainage of low lands; in the construction and maintenance of embankments to resist the encroachments of the sea; in the formation of roads, carried with gentle gradients over the scientifically-sought lowest summits; in the erection of bridges over wide and rapid rivers—as, for example, the world-famed Victoria Bridge at Montreal; in the infinitely varied machinery, which appears almost endowed with life and reason, so wonderfully does it perform the ponderous as well as the delicate tasks entrusted to it in the factory, in the mill, in the arsenal, in water, and on land,—we recognize, once again, the skill and toil of the Mechanical and Civil Engineer.

Among the labors of the Engineer, none, perhaps, possess more interest to this country, and especially at the present time, than those connected with

CANALS.

It appears not improbable that the earliest canals were constructed in Egypt, and had for their object the better irrigation of the Delta of the Nile. Herodotus, whose narratives, however, must generally be taken "*cum grano*," speaks of the formation of a lake called Mœris, 450 miles in circumference, which was completed about 1385 years B. C. This was connected with the Nile by three canals, and its objects were to prevent the Nile continually overflowing the country, and to maintain a supply of water for irrigation.

Many canals are said to have been subsequently formed in Egypt by Sesostris; and about 610 years B. C., Necos is said to have commenced a canal to unite the Mediterranean and Red seas. This was continued by several monarchs, but apparently never completed, and was finally abandoned, until the Caliph Omar, about the year A. D. 644, or some 1254 years after its commencement, re-opened it, and cut another canal, which was used for upwards of 120 years, until the commerce of Alexandria was destroyed.

In Greece, many attempts to cut a canal across the Isthmus of Corinth, a distance of about five miles, failed. The traffic, and even the smaller craft, were, therefore, carried across it—somewhat as our passengers and goods are conveyed overland between Carillon and Grenville, *en route* to Ottawa.

Spain is indebted to the Moors for her canals, and for her system of irrigation generally. In China, the canals were said to have been of great antiquity; but they are probably not older than 900 years ago, a hundred years later than the first irrigation of Valentia.

In Italy, canals were of very early date. That through the Pontine marshes was cut about 162 years B. C.; and the Etruscans had made many before this, in connection with the river Po. The Romans attached very considerable importance to such works, and, both at home and abroad, frequently executed extensive works to improve the inland water-communication. But these works fell into decay with the decline of the Empire, and it was not until the 12th century that the construction of canals recommenced in Italy and Holland.

Between the 12th and 15th centuries many improvements in connection with canals were made in the navigation of the rivers Brenta, Mincio, Arno, Reno, Ticino, and Adda. But it was not until the year 1481 that two brothers, said to have been Dionisio and Pietro Domenico, of Viterbo,

introduced, in a canal running from Padua to Stra, the lock-chamber enclosed by a double pair of gates, instead of the arrangement called the "conch," which had been in use in Italy since the 12th century. The fame of the invention of the lock spread throughout Europe, and the whole system of inland navigation benefitted by it.

Among the first navigable canals commenced in France, after the Roman era, was that from the Saone to the Loire. This was begun about the middle of the 16th century; but progress was suspended from time to time, and it was not finally completed till about the close of the 18th century. The canal is about 71 English miles long; the length of each lock is 100 feet, and breadth 16 feet; breadth of the canal at the top, 48 feet; at bottom, 30 feet; with an average depth of 5 feet 3 inches. There are 30 locks from Dijon to the summit-level, giving a rise of about 240 feet; from whence to the Saone there is a descent of 400 feet, accomplished by fifty locks.

The canal of Languedoc connects the Garonne, below Toulouse, with the Mediterranean, at Cette. It was commenced about the year 1666, and completed in 15 years. It is 64 feet broad at top, 34 feet at bottom, and 6 feet 4 inches deep. The vessels which navigate it carry about one hundred tons.

Another remarkable canal is that connecting the Somme with the Scheldt, which was commenced in 1766 and completed in 1810. Its length is 32½ miles, including two tunnels—one of 1200 yards, and the other of 3¼ miles long. It rises in its course 33½ feet, and falls 124 feet.

There are now in France nearly 3,200 miles of canals, a vast extent, especially when we consider that such works were commenced in that country nearly 400 years after they revived in Italy, and when we reflect upon the interruptions to which they were subjected during all their earlier history.

Before quitting the subject of canals, in connection with French engineering, we must for one moment refer to the Suez canal. This canal, nearly 100 English miles in length, runs from Port Said to Suez. The mean level of the Red sea is only 6 inches higher than that of the Mediterranean, and the tides in both seas are feeble; consequently, there are no locks. It is intended to attain a depth of 26 feet of water throughout. Its cost will probably be £20,000,000 sterling. Its execution is mainly due to the rare courage and perseverance of Mr. Ferdinand de Lesseps, who, by cutting across the sand uniting Asia and Africa, has opened a water-communication which may revolutionize the mode of conducting the traffic between the east and west, and which may never be closed while civilization exists.

Late as France was in the field, England was even later; for the first canal of any importance in England was that from Worsley to Manchester, constructed by James Brindley for the Duke of Bridgewater, who, in 1758 only, got an Act of Parliament for it in order to open out his coal-fields in South Lancashire. The construction of canals then became the rage, and prevailed during 40 years, and less ardently for nearly 30 years longer. As a result, there are about 120 canals in the United Kingdom, having an aggregate length of 3,000 miles. And as the superficial area of France to the United Kingdom is as 12 to 7, the latter possesses, in proportion to the size of her territory, very much more canal-accommodation than France.

Among the canals in Britain, the Bridgewater canal, already referred to, is justly celebrated for the excellence of its works, constructed, as they were, in the infant days of canal-making, by which, except for a distance of 600 yards, at Runcorn, where the Mersey is entered by 10 locks, which are together 82 feet 6 inches, the navigation for 73 miles is on one level.

The Caledonian canal, connecting the Scotch lochs, and affording, with 21 miles of canal, a navigable line

upwards of 100 miles in length, between the seas on the eastern and western coast, will never be forgotten by any who have had the happiness of beholding the surpassing beauty of the surrounding scenery.

The depth of water in the canal is 20 feet. The canal is 122 feet broad at top, and 50 feet broad at bottom; and there are 23 locks, 40 feet wide each, and 172 feet long. The work occupied from the year 1803 to 1829, and the total cost was nearly £1,000,000 sterling.

On the Ellesmere and Chester canal is a celebrated aqueduct, by which the canal is carried at a level of 127 feet over the river Dee. The bottom and sides of the canal are here made of cast-iron plates, within which the water flows. The water-way is 11.10, of which the towing-path covers 4.8. The total cost of the aqueduct was about £47,000, sterling.

The Grand Junction canal, which connects the iron and coal fields of the Midland Counties with London, falling into the Thames at Brentford, is 90 miles long, 42 feet wide at the water-surface, 28 at bottom, and 4 feet 6 inches deep; lock-chambers, 80 feet long; breadth, 14 feet 6 inches. Steam-power is required to raise the water for the supply of the canal from one reservoir to another. The canal, in its course, first rises 37 feet, then falls 60, and then 112 feet; rises again 192 feet, and falls again, first 127, and then 268 feet. Its total cost was about £2,000,000 sterling.

In the Huddersfield canal, there is a rise of no less than 436 feet, made by 42 locks, and a subsequent descent of 334 feet, divided by 33 locks. The Leeds and Liverpool canal is 127 miles long, with a rise to summit-level of 411 feet, and a fall of 433 feet. The locks will receive boats 70 feet long and 14 feet beam, and the least depth of water is 4 feet 6 inches.

The Shropshire canal presented a very curious feature in its inclined planes. It passed through a rugged country with a great scarcity of water. On the banks of the Severn on an inclined plane 1050 feet long, with 207 feet of perpendicular height, was a strong double railway, up which the boats, with their loads of five tons each, were drawn. They then passed along a level canal, descended by another inclined plane, and so on. These works were completed in 1792.

The canal tunnelled through the chalk between the Thames and Medway is in all 7 miles long, of which 2½ miles form the tunnel. It occasioned considerable anxiety and inconvenience by affecting the wells in the neighbourhood; but it saves the passage round the Nore and up the Medway, and nearly fifty miles in navigation.

A curious tunnel was one constructed by Brindley, only 9 feet wide and 12 feet high. It was nearly 3000 yards long, and boats could only be propelled through it by men called "leggers," who, lying on their backs, pushed against the sides and top of the roof with their feet. A boat occupied two hours in passing through. It has been replaced by more convenient works.

On the Great-Western canal were made lifts 46 feet high, up and down which boats weighing about eight tons ascended and descended in cradles, in about three minutes, with an expenditure of about two tons of water only.

Holland.

Holland, the level of a great portion of which is beneath the sea, is a country covered with embankments and canals. The very rivers are maintained within their course by artificial banks. Where the canals do not unite, vessels are transported from one to the other by mechanical contrivances. As a modern work may be mentioned a new

ship-canal, to be finished in five or six years, now in course of construction, to connect Amsterdam with the ocean. The distance by the present canal is fifty-two miles; that by the new canal will be 15½ miles only, navigable for larger vessels than can now come up. This canal will be 197 feet wide at top, and 88 feet at bottom; minimum depth, 23 feet; locks, 59 feet wide. It will connect with a magnificent new harbour, which is being formed on the coast, by three locks or entrances. At the other extremity, below the city and wharves of Amsterdam, will be a vast dyke to shut out the Zuyder Zee, with three locks and sluices. The surface-water of this canal has to be kept twenty inches under low-water-mark; and the locks at each end are required for locking down. Besides the locks and sluices, three centrifugal pumps have been provided, which, together, will lift 440,000 gallons of water per minute. The shallow lakes through which the canal runs have to be re-drained to admit of this.

The United States.

It would be useless for me to enter here into any description of the canals existing in the United States. They are probably better known to most present, practically, than they are by me, even theoretically. It may be sufficient to say that in this, as in other Engineering works, the people of the United States have shewn themselves worthy descendants of the mother-country. No labor has been spared to render inland-water-communication complete. One of the peculiar features has been the admirable use made of timber in the construction of viaducts. Another is the vast length of the conjoined canal and river lines. Thus, the Ohio canal, between Portsmouth and Cleveland, is 307 miles in lentgh; the canal between Albany and Buffalo, on Lake Erie, with its numerous branches, and that between Albany and Oswego, on Lake Ontario, are respectively 363 miles and 209 miles in length; and the

canal from the Hudson river into Lake Champlain is sixty-five miles in length. In the Morris canal, the rise and fall of 1674 feet in about 102 miles was mainly overcome by inclined planes, with a lock at each end and at the top of each plane, the boats being drawn up and lowered down the planes by machinery. The length of the canals in the United States much exceeds that in Britain; and there can be no doubt, from the energy and vitality which its people display, that wherever a canal is required in the States, there it will be made.

Canada.

In Canada itself, the Welland canal, 28 miles in length, connects Lakes Erie and Ontario. It has a fall of 260 feet, and can pass through vessels of 400 tons. From Lake Ontario to Lake St. Louis, seven short canals of the total length of 47 miles, overcome the fall of 220 feet in the river St. Lawrence. Through these, vessels of 650 tons can pass. The United States canal, of about one mile in length, at the Sault St. Marie, connects Lakes Huron, Superior, and Michigan. Vessels of 2000 tons can pass through this canal.

By these canals, and those already referred to as connecting Lake Erie and Lake Ontario with Albany, navigation exists between the tidewaters of the Hudson, the Upper Lakes, and the St. Lawrence sea-navigation.

The further improvement of canal-communication would appear to be of the highest importance to the development of Canada; and it is satisfactory to know that the subject is attracting more and more attention.

The Canal Commissioners, in their recent report, dated 24th February, 1871, recommend the construction of a new canal in Canadian territory at the Sault St. Marie; the enlargement of the Welland canal and of the St. Lawrence canals; the construction of a second set of locks at the lower entrance of the Lachine canal, with 17 feet of water on the sills; and the

improvement of the channels of the St. Lawrence, so as to give 14 feet of water throughout above Montreal, and 22 feet draught, at low water, between Montreal and Quebec: the canals to have an uniform width of 100 feet, with locks having 270 feet of chamber between the gates, 45 feet in width, and 12 feet of clear draught on the sills; the bottom of the canal to be at least one foot below the sills of the locks. By these means, it is considered that vessels ranging between 1000 and 1500 tons could trade between Chicago and Montreal, a distance of 1261 miles.

In addition to the above, the Commissioners recommend, as works of first-class importance, the improvement of the existing line from Allanburgh to Port Dalhousie; the Ottawa canal improvements, from Ottawa city to Lachine; the enlargement of the Chambly canal, and the construction of the Bay-Verte canal.

The locks for the Ottawa and Chambly canals are recommended to be 200 feet by 45 feet, with 9 feet draught over the sills; the locks for the Bay-Verte canal, 270 feet in length of chamber, 40 feet in width between the gates, and 15 feet draught of water on the sills.

The Commissioners further recommend, as works of the second-class, but prospectively of the utmost importance, the construction of the Upper-Ottawa canal, and the deepening of the rapids of the St. Lawrence to a minimum depth of eight feet at the lowest water.

The Rideau Canal should be maintained as one of the public works of Canada; but the construction of the Caughnawaga canal, and of the Erie and Ontario ship-canal, the Commissioners consider should be left entirely to private enterprise. The projected Georgian Bay canal, which is equal in length to that of the Suez canal, and is encompassed with natural obstacles infinitely greater, is regarded as commercially worthless, if not as physically impossible.

The cost of the improvements recommended is estimated at $19,170,000. But this expenditure is considered as insignificant when compared with the immense benefits that would arise from the carrying-trade of the great West passing through Montreal and Quebec. The Government, as I gather from the columns of the daily press, have decided to proceed with a portion of the improvements recommended for the Welland canal, for the Ottawa canal at Grenville, and for the St. Lawrence; but have deferred action regarding the remaining recommendations, on various grounds. Cordially must we all unite in hoping that in these most important works, Engineering and Engineers may assist its people to the utmost possible extent in developing the resources of this noble country, before which such prospects of a great, useful, and happy future are being so continuously unfolded.

RAILROADS.

The question of *railroads* is not of less importance to the Dominion of Canada than that of canals.

Prior to the 17th century, wooden railroads were in use at the Newcastle coal-fields. Originally, the waggons worked along single lines of longitudinal timbers; but as the frequent repair interfered with the traffic, an upper rail of wood was pegged to the timbers, and renewed as it wore away.

The first iron rails were probably those of cast-iron used at the Norfolk colliery, near Sheffield, about 1776; but cast-iron wheels had been introduced about ten years before at the Colebrooke-Dale iron works. At this time the flange was on the rail, instead of on the wheel, as at present.

Various improvements succeeded; and in 1820 a patent was obtained, embodying the principles upon which rails are now made for railroads, viz., by passing them, when red-hot, through rollers grooved in the required form.

In 1802, the first patent was taken out by Richard Trevithick for a locomotive-carriage, on the high-pressure principle, to work on a road or railroad. In 1811, Mr. Blenkinsop took out a patent for the first double-cylindered engine. This weighed five tons, and drew 94 tons on a level, at 3½ miles an hour; one wheel being toothed, and working in a rack on the side of the railway. Various improvements followed; and in October, 1829, took place the famous trial in which Mr. Stephenson's and Mr. Booth's locomotive, the *Rocket*, won the prize.

The *Rocket* and tender weighed only 7½ tons, and drew 44 tons, gross, at the rate of 14 miles per hour. From this may be said to date the present locomotives.

Between 1811 and 1822, increasing attention had been drawn to the subject of railroads. In that year the Stockton and Darlington Railway was proposed; but, from the opposition met with, the act was not obtained until the following year. This was the first railway opened in England. In 1824, the bill for the railway between Liverpool and Manchester was lost, in committee, from a similar cause, and withdrawn. It was not again introduced until 1826, when it triumphed over all opposition, and the line was at once proceeded with. From that time the construction of railways proceeded with increasing rapidity in England, until it became almost a mania, which reached its climax about 1845, and vast fortunes were made and lost in railway speculations. Since that time, however, many lines have been made, but with more consideration as to their necessity and probable commercial results.

From England the construction of railways spread over Europe, and extended to the United States. But it is a fact, and remarkable as shewing how slow the very ablest men sometimes may be in grasping the value of the results of science, that, soon after Louis Philippe came to the throne of France, Monsieur Thiers, now President of the present government in France, was sent to England to examine into the

advantages of the railway system, and reported against its adoption in France; and that thus the introduction of railways in France was postponed for eight or ten years. Such an error of judgment may, however, be the more readily excused when it is remembered that so late as the year 1835, Dr. Lardner, a man unquestionably of the highest ability, declared that it was a mechanical impossibility for steamers successfully to cross the Atlantic.

As a sort of contrast, and as among the most interesting works of the period, we may turn to those known as the Mont Cenis Tunnel and the Mont Cenis Railway. The estimated length of the tunnel, which does *not* pass under Mont Cenis, is $7\frac{3}{8}$ miles (English), and the cost not less than £4,000,000. It is intended to connect the railways of France and Italy. The rails of the Mont Cenis railway, which is altogether independent of the tunnel, follow the surface of the road over Mont Cenis. The necessary adhesion is obtained, and also perfect safety to the train, by the pressure of horizontal wheels on a central rail. The new engines will take up loads of 50 tons. Between St. Michel and Susa, the line is 50 miles in length. It cost, with engines and rolling-stock, about £8,000 a mile, and affords an admirable solution of the difficulty of surmounting mountain ranges at a moderate cost. The working expenses are, however, heavy.

There are now in England between 14,000 and 15,000 miles of railway; in France, between 10,000 and 11,000 miles; and in the United States, upwards of 43,000 miles. The latter lines, however, though made to carry the traffic which passes over them, cannot compare for finish with the lines at home.

Railroads in Canada.

In the Dominion of Canada there are already upwards of 3,000 miles of railway; and the new lines in process of construction, including the Intercolonial line, will increase this

length by nearly one-half. The means by which the Canadian Pacific Railway, spanning the continent and connecting the two great oceans, is to be accomplished, are now under the consideration of the Dominion Parliament. Before this can be completed, many other lines will, no doubt, have also been made. We may hope that there may never be found wanting, to the Dominion, statesmen to advocate and carry out such railways as may be of vital aid in its development, nor Engineering and Engineers to execute, at the least expense, and with the best work, the railways which the State or private enterprise may undertake.

Before quitting this subject, may I be allowed to express my dissent from the extreme strictures which I have heard passed upon the manner in which the railways in Canada are managed. I am not saying that some improvements in details might not be effected. But I do say (and I have some right to give an opinion on such matters, having had charge of the construction and working of railways in New South Wales, in addition to that of the telegraph, roads, and other public works of that colony,)—I do say, that when the extreme difficulties arising from the climate are considered, and the inconveniences unavoidable with long single lines of railway, the working of the lines, the comparative rarity of accidents, and the almost entire absence of loss of life, merit approbation, rather than such censure. I say, further, that in a comparatively new and sparsely settled country, twenty miles an hour, actual distance made, is a sufficient rate for practical purposes. Still, there are improvements which might easily, I should conceive, be made. For instance, the *unnecessary* delays between Montreal and Quebec might cease; and I was glad to see that the Board of Trade* of Quebec had been urging on the Managing-Director of the Grand Trunk Railway the necessity of better

* NOTE.—The establishment of the Dominion Board of Trade must be considered as a measure calculated in the highest degree to benefit the Dominion of Canada.

arrangements in connection with Quebec. There can surely be no real difficulty in arranging that we may take our tickets and check our baggage on this side of the St. Lawrence, instead of on the other; and we may even hope that in time we may be ferried over so as to catch the train, and not some hours before it starts. Indeed, so evident does it appear that much of this could with ease be done, that I am disposed to think that the fault rests more with ourselves for letting such matters sleep, than with those whom in all my relations with them I have invariably found so courteous and willing to attend to any suggestions for the public convenience, as the officials of the Grand Trunk Railway.

ELECTRIC TELEGRAPH.

I must absolutely refuse to be seduced into saying anything whatever about the Electric Telegraph, a subject which so naturally recurs to the mind in connection with improved communications. It affords, in itself, matter more than sufficient for one e vening. I will only say that we appear to be still in the infancy of our knowledge of electricity, and that we may anticipate, from the development of its powers, perhaps even greater wonders than the amazing and invaluable results already obtained.

ROADS.

The wonderful inland water navigation of Canada, and the early introduction of railways, render *Roads* a subject of less importance than in other countries. Still they must have a large influence on the future of Canada.

As an instance of their value, it may be remembered that the Highlands continued in a state of semi-barbarism until the construction throughout their length and breadth, by the government, of roads; and the law still holds good that there is no surer means of increasing the prosperity of a country than by improving its means of communication.

I shall not occupy your time with any description of those superb roads constructed by the Romans, not only in Italy, but wherever their conquests extended, and which have won the admiration of all succeeding ages. Of these, the great roads alone extended over 53,000 Roman miles. They were constructed with vast labour and expense, and maintained with the utmost care. But with the decline of the Empire, they fell into decay, and the succeeding period of barbarism was as fatal to the *preservation even* of internal communications, as it was to science and art generally.

Some efforts towards improvement were, indeed, made in the seventh century, under King Dagobert, and these probably involved the partial restoration of some of the Roman roads.

In the same era we find existing the abominable system of "*corvée*" or forced labor on the roads, which cropped up from time to time, until it finally disappeared in the revolution of 1790.

Charlemagne, towards the close of the 8th century, revived "the ancient laws and customs" under which each district was bound to construct bridges and roads; and this was more or less enforced to the middle of the 9th century. But the bridges were mere causeways or approaches to ferries over rivers, and the roads for the next three centuries were little better than winding horse-paths. But the crowds of pilgrims flocking yearly to the shrines of favorite saints, and the crusades imparting new activity to travel, and slowly-growing civilization, forced, in the twelfth century, attention to the state of the roads. Then, to build a bridge was a work of charity, and large properties were dedicated for ever for their construction and maintenance. And about this date arose the celebrated monastic order of Bridge-builders, known by the name of "Brothers of the Bridge," or Pontifex (Bridge-builder). Their reputed founder was the whilom shepherd, St. Benezet,

who built the bridge of Avignon over the Rhine, between 1177 and 1187, A. D. They were a mendicant order, solely however to raise funds for bridges, and continued for several hundred years, and constructed bridges in most parts of Europe. The last of them was the Monk Romain, who was also probably the first of the engineers in the far-famed *Corps des Ponts et Chaussées* of France, when instituted in the early part of the last century.

Efforts were made in France in the reign of Louis XI. and subsequently, by the establishment of post-horses and relays of horses, and by the appointment of the Treasurers of France, afterwards known as the Receivers-General, to improve the great highways; but even these were never suited for rapid travelling, except by horsemen, and they had fallen into a miserable condition at the death of Louis XIV. But under the celebrated *Corps des Ponts et Chaussées*, improvements on systematic and scientific principles were commenced and continued, and admirable roads by degrees provided. These under Napoleon the First were divided into three classes—the royal, the departmental, and the rural roads—the 1st kept in repair by the State, and the 2nd and the 3rd by the provinces and by the districts through which they passed. France has, or at any rate had until now, about 100,000 miles of good carriageable roads.

The best roads in Great Britain, for centuries, were the remains of those left by the Romans. In the 13th and 14th centuries we find efforts made to improve the communications by the removal of trees on either side, and by the levying of tolls to repair roads reported impassable. Turn pike roads were established and acts were passed for repairing and widening some of the public roads on the return of Charles II.; and between the years 1700 and 1770, no less than 530 acts of Parliament relating to turnpike roads were passed. For all this, however, a century ago the roads of Great Britain were in a sufficiently miserable condition. But between this period and the present, there have been constructed or improved

160,000 miles of good carriageable roads in the United Kingdom, of which many are probably as perfect specimens of road-making as can exist,—affording daily proofs, to the thousands who traverse them, of the practical value of Engineering and Engineers.

LIGHTHOUSES, BREAKWATERS, HARBOURS, DOCKS, QUAYS, WHARVES, AND RIVERS.

To a great maritime power like the Dominion of Canada, fourth, if not indeed since the misfortunes of France third among the maritime powers of the world, lighthouses, breakwaters, harbours, docks, quays, and wharves, and the improvement of rivers by embankments, cuts, or dredging, must ever be subjects of primary interest. It is obvious, however, that we can to-night take but the merest glance at them.

One of the most celebrated ancient lighthouses on record was that built on the Isle of Pharos by Sostratus, of Cnidos, to render the harbour of Alexandria approachable at all times. This Pharos was built of stone, and was 450 feet high; and, it is said, could be seen at a distance of 100 miles. The light consisted of fires lighted in a species of lantern at the top.

The Romans constructed pharos or lighthouses, as at Ostia, Terracina, Puteoli, Antium, &c., the lighting of which was also managed by fires at the top. Some of these were superbly built of stone, and contained accommodation for those entrusted with the care of the ports. A specimen of the Roman Pharos, but of a ruder description, may be seen in England, in Dover Castle.

A very remarkable lighthouse in France was constructed at Cordouan, two leagues from Bordeaux, between 1584 and 1610, by Louis de Foix, on an island, dry at low water, but

completely covered at high water. The height of the building from the rock was 162 feet. Reflected light was used in this tower for the first time about the year 1780.

The shores of the narrow seas which surround Great Britain abound in lighthouses: among the most famous are the Eddystone and the Bell.

The first Eddystone lighthouse near Plymouth, was built between 1696 and 1699, and was destroyed in 1703 by a violent storm, in which the engineer and workmen employed in its maintenance, as well as the keeper, perished. It was rebuilt between 1706 and 1709, but destroyed by fire in 1755. It was recommenced under the celebrated Smeaton, in 1756, and again completed in a little more than three years, and, happily, remains now as perfect as when built.

The Bell-rock lighthouse, which protects the trade of the friths of Forth and Tay, and of the North sea and German ocean in the vicinity of the Bell-rock, was commenced under the equally celebrated Robert Stephenson, in 1807. Its principle is the same as that of the Eddystone lighthouse.

At Lowestoft is a lighthouse nearly 200 years old, situated on the cliff overlooking the German ocean. In this the light was formerly given by a coal-fire within a glazed chamber, and was said to be visible for a great distance at sea.

About twelve or thirteen years ago, a lighthouse was constructed on Roman Rock, at Simon's Bay, Cape of Good Hope. The structure was a circular tower, 15 feet diameter, 48 feet high, of cast-iron plates, with a central shaft 16 feet diameter for the revolving machinery. Great difficulties existed, as only once in three years was it so calm that no sea broke over the rocks at *low* water. From various reasons, the iron plates failed; and it was found necessary to surround the first 24 feet in height of the tower with

granite, backed with concrete. This was completed by the end of 1866, and the tower now serves to warn the mariner against the "Cape of storms."

Moles and Breakwaters.

The use of moles and breakwaters to break the force of the waves and afford additional security to anchorage, dates from the earliest ages, and has been continued by every seafaring nation. It is impossible to do more here than just to refer to them. Among the most celebrated at home, and worthy of special mention for the lesson which it teaches of the value of consulting nature in such works, is the *Plymouth Breakwater.*

This work is 5100 feet long at the top, and 5310 long at low-water-line. The depth of water in which it is situated varies from 36 to 60 feet at low-water spring-tides. The tides rise from 12 to 18 feet. The lighthouse is on the west end. The work was commenced in 1812, and is mainly composed of vast masses of lime-stone thrown into the sea, *which has been allowed to form the outer slope.* In 1841, when the work was considered as completed, nearly 3,400,000 tons of stone had been used in it, and the cost had amounted to nearly 1½ millions sterling. A fort has recently been constructed in rear of the centre of the breakwater, which, with the works on either shore, defend the entrance into Plymouth.

Harbours, Docks, Quays, and Wharves.

My space absolutely forbids that I should enter into any detail regarding harbours, docks, quays, and wharves. They have necessarily occupied the attention of maritime nations in every era; and now, not only the ever-growing traffic of the world, but also the vastly-increased tonnage of the ships that bear that traffic call for fresh efforts. Nothing in engineering involves heavier expense or requires more sound judgment

and sterling ability than works of this nature; and the manner in which the wants of the age are met reflects the highest credit upon Engineering and Engineers.

Bermuda Dock.

As an interesting and novel effort in providing a dock, may be mentioned the building, and transport across the ocean, of the Bermuda dock. A dock capable of receiving large vessels of war had long been an absolute necessity at Bermuda. It was found impracticable to construct it of stone. A hulk was, therefore, constructed at home, with hollow sides and bottom, each fully 20 feet wide. The interior of the hulk is shaped to the form of a large vessel, and gives a dock 330 feet long, 84 feet wide, and 53 feet deep. The hulk is of wrought-iron, about half an inch thick, and weighs about 8,200 tons, besides 400 tons in the caissons. It will take in any vessel now afloat, except the *Great Eastern*, which is too wide. Our largest ironclads, having a displacement of 10,200 tons, can be lifted by it so as to have their keel out of water. The dock, using her caissons, will lift and lay completely dry a vessel weighing 8,000 tons; and the dock, being in the form of a ship, can be heeled over so as to be thoroughly cleaned from fouling. The dock occupied two years and nine months in building, and was thirty-six days in being towed to Bermuda. Her draught of water, light, is 11 feet 2 inches, and 50 feet when submerged for docking a large ironclad. We are indebted to Lt.-Colonel Clarke, of the Royal Engineers, C. B., Director of Works to the Admiralty, for this dock.

Harbours and Docks in Germany and Malta.

In northern Germany, great attention has been, and is still, being paid to the construction and improvement of dock-harbours and dock-yards, both for naval and commercial purposes. Among these may be mentioned the Royal dock-yards at Wilhelmshaven on the Jade, and at Kiel. But the

widest and deepest dock in the world is the new Royal naval dock at Malta, which was opened on the 16th of February last, and named the "Somerset Dock." It is 34 feet deep, 80 feet wide at entrance, 104 feet wide between the copings, and 430 feet long. It cost, including the heavy works necessary in making an entrance to it, about £150,000 sterling.

Improvement of Rivers.

The improvement of rivers by embankments, cuttings, dredging, &c., requires the nicest judgment in the Engineer. The force of an apparently trivial flow of water is so irresistible when that flow is stopped, and the action of water on a large scale so often varies from the expectations entertained, that the best Engineering is required to deal with such forces.

Holland.

Holland is pre-eminently the land of embankments, not only as regards its rivers, but also the dykes raised to resist the encroachments of the sea. These are, in many places, 30 feet above the level of the ocean. And as an instance of how the simplest may often be found the most effective means, it may be mentioned that bundles of reeds twisted together, laid horizontally, and secured to the dykes, with piles driven in above the reeds, are found among the best methods of retaining the dykes towards the sea.

It has been by these means, and by drainage, that Holland, much of which is below the sea, now embraces some of the richest land in the world, and bears its testimony to the happy results of Engineering and Engineers.

Embankment of the Thames.

The embankments in England, along the river Thames, date back certainly from the period of the Romans. As a

magnificent specimen of modern work may be mentioned the embankment from Westminster bridge towards London bridge, along the northern bank of the same river.

DRAINAGE OF LOW LANDS.

The drainage of low lands presents, not only on account of the rich soil which is usually thus acquired, but of the improved health gained for the entire vicinity, another field for Engineering and Engineers, the value of which will increasingly be felt in Canada.

WATER FOR IRRIGATION AND GENERAL USES.

In connection with drainage, our thoughts naturally turn to the supply of water for irrigation, and for the general uses of man. We trace the progress of this branch of Engineering in the simple contrivance of the pole and bucket, still to be seen in daily use in many parts of the world; in the adoption of the principle into most countries, and its extension by the use of animal power; in the land "watered by the foot;" in the narrow channels along which the fertilizing water was led as it is led to the present day; in those canals of which we have already spoken; in those vast reservoirs in India which count their embankments by thousands of miles, and their works of art by the hundred thousands; on which vast territories depend at times for their very existence, and which Australia, if she intends to grow in prosperity as she should do, must in some measure imitate. We have it in another form at Jerusalem, and find it's witness in the ruins lately explored there; in the ancient Alexandria; in those superb Roman aqueducts and other works, the very remains of which are magnificent; in such works as those which supply busy Glasgow, by gravitation, with the purest of water from the distant shores of lovely Loch Katrine, or as supply, on this continent, the young giant city Chicago; or—and we are glad to note the exception to the general gloom and decay which have settled on

modern Spain—as evidenced in those works which have recently supplied Madrid with good water at a cost of upwards of 2¼ millions sterling. And we trace its more delicate touches in the artificial lakes and refreshing fountains which give fresh charms to our cities, parks, and gardens; and in that additional comfort in our homes, the value of which we, perhaps, only realize when extreme cold or other causes deprive us of it.

DRAINAGE AND SEWERAGE OF TOWNS.

The drainage and sewerage of towns present another field of Engineering, and one of daily-growing importance as population increases, and as the absolute necessity is seenof avoiding the pollution of streams and rivers. Certainly, there are at least many situations in which some "dry-earth" system must receive an amount of attention greater than has as yet been bestowed upon it. The cloacæ of Rome and the main sewerage of London may be mentioned as remarkable ancient and modern instances of this branch of Engineering.

MACHINERY.

We must pass by the entire branch, wonderful indeed as it is, of machinery; from the mighty marine engine; the locomotive, with its surprising strength and speed; the whole system of pumps and pumping engines; the hydraulic press; the ponderous Nasmyth hammer; the mighty planes for iron; the steam-rollers for road-making; the exquisite machines that supply more accurately and with infinitely greater rapidity than man, their maker, could do the most delicate articles for peace, and the finest portions of the stores required for war, in the production of which this continent has rivalled Europe. On one point only, and that because it is of practical and growing importance in every-day life, will I for a moment detain you. I refer to

the necessity of the utmost care in the construction and maintenance of steam boilers, and of their periodical inspection.

A very interesting paper on this subject, by Mr. Martin, of Stourbridge, was read at the Nottingham meeting of the Institution of Mechanical Engineers, in 1870. During the four years from June, 1866, to June, 1870, there were no less than 565 explosions, or about five in every two days. Of these, 219 occurred in England and 346 abroad. By the 219 which occurred in England, 315 persons were killed and 450 persons injured. Out of these 219 explosions—

95 were due to faults of construction or repair;
62 " " to faults to be detected only by periodical examination;
54 " " to faults which should be prevented by careful attendants; and
8 only to extraneous or uncertain causes.

Thus, with the exception of eight out of 219 cases, the causes of explosion would have been detected by periodical examination. It must be remembered also that all boilers, however good in original construction, are liable in course of time to get out of order and explode, and that this liability is vastly increased if the boilers are originally so constructed or set, as is still often the case, as to render examination next to impossible. Further, that even with boilers whose original construction promises safety, that safety is ensured so long only as everything is maintained in good condition; and that an originally excellent boiler may be so weakened by repairs as to ensure explosion. This matter comes closely home to us all; for, out of the above-named explosions, between six and seven per cent. occurred in domestic or heating-apparatus boilers, and several in the portable crane boilers so commonly used on wharves.

It may be well, further, to mention that—1st, boilers which bear the hydraulic test may still be dangerous; 2nd the condition of a boiler can be satisfactorily ascertained

only by periodical examinations; and 3rd, the cost of periodical examination is so little as to be far outweighed by the greater security obtained.

MILITARY ENGINEERING.

A very few remarks must be given to the large subject of Military Engineering. The improvements in arms has led to alterations in works of defence; the new system superseding those previously adopted, as completely as these set aside the works of previous ages. Among the objects now principally sought are so to trace the works as to prevent enfilade while securing a heavy fire on a besieger; the cover from hostile fire of such masonry as must of necessity be used; sufficient casemated protection; and the retention of good ditches and powerful flanks protecting the ditches to the latest possible period of a siege. In the arms themselves, we see the results of the earnest application of science to Military Engineering in the production of guns whose powers are marvellous, and of the breech-loading rifles, and ammunition, and mitrailleuse, of the day. Of the guns, the latest offspring is that named the "Woolwich Infant," 35 tons in weight, with a bore 11½ inches in diameter, and a projectile of 700 lbs. weight, capable of a charge of 160 lbs. of powder, and of a range of 6 miles. Ten similar "infants" have been ordered to be manufactured, that, with others, will probably be lodged, trained, and made of use as necessary, on board the large monitors now building, each vessel carrying four in two turrets. Of the rifles, the Henry-Martini, the last approved, is considered to surpass even that most beautiful weapon, the Snider-Enfield. The ponderous weight of the guns has, in turn, evolved the most ingenious mechanical appliances for working them and for supplying their ammunition. The excessive recoil produced by the heavy charges has been neutralized by similar means, and even taken advantage of by Captain Moncrieff, R.A., to lower the gun under cover. The enormous pressure on the guns, produced by the same

heavy charges, has led to the invention of Captain Noble, R.A., for testing the pressure of the charge when fired upon every part of the gun, and to the substitution of gunpowder of greatly increased size and of slower combustion—the later arising, I am informed by one of my brother-officers in the Artillery here, mainly from increased compression. The importance of the slower combustion may be seen from the fact that projectiles fired with one description of powder may produce no more effect than those fired with another description of powder upon the object aimed at, while the disruptive effect of the powder upon the gun from which it is fired may be one-third greater; or, in other words, one powder can do an enemy no more harm than the other, while it will do its own gun one-third more harm. The tremendous effect of such missiles and powder upon works of defence has evolved a combination of iron-plates so ingeniously held together and so placed upon the works as to defy even that effect; while the power of vessels armed with such guns as the "Woolwich Infant," and themselves armour-plated, has led to fresh means of defence in torpedoes and submarine mines exploded by electricity. And it is a fact, full of significance, that Lord Napier of Magdala is an Engineer—Napier, who, in Abyssinia, shewed with what a lavish hand and with what effect England, idly called degenerate, can pour out her men and treasure when the lives and liberty of Englishmen are concerned; and that Moltke, the now world-famed strategist of Germany, is also an Engineer.

My time and I am sure your patience are exhausted; and yet, as you will have perceived, many subjects have been barely sketched, and very many have been altogether omitted. In considering those subjects which *have* been touched upon, I have very freely availed myself of the papers of the Institution of the Civil Engineers (including the charming address of Mr. Vignolles, its very able President in 1869-70); of the papers of the Institution of Mechanical Engineers; of Cresy's

Encyclopædia of Civil Engineering; of the Year-Book of Canada for 1870; and of the columns of the Daily Press. My thanks are also due to S. J. Dawson, Esq., C. E., of the Department of Public Works at Ottawa, for a number of reports and pamphlets on the public works of the Dominion of Canada.

Before I sit down, I would just bring under your attention the encouraging fact—encouraging especially to a young country before which such a vast future is unfolding itself as is the case with the Dominion of Canada,—the encouraging fact of the comparatively very recent period within which the most useful inventions of modern times have arisen, and of the speed with which these inventions have been improved upon. It is barely a century since the construction of canals and roads was commenced in earnest in Great Britain, or since the first little steamers appeared in France and Scotland; and it is much less than a century since the first efficient steamer was made. It is about three-quarters of a century only since Murdock first lighted his house and offices at Red Ruth in Cornwall with gas; it is 63 years only since a very *small* portion, and much later since any *large* portion, of London was lighted with gas. The birth of railways and of the electric telegraph is cöeval with that of those present here to-night of middle age. What, then, may our descendants not hope to see? And is it too much to say that in its progress towards prosperity, power, and increasing influence for good, the interests of this great Dominion of Canada are inseparable from those of Engineering and Engineers?

APPENDIX.

REPORT OF THE COUNCIL

OF THE

LITERARY AND HISTORICAL SOCIETY OF QUEBEC,

FOR THE

YEAR ENDING 31ST DECEMBER, 1870.

THE Council has the pleasing duty to report that the past year has been one of increased and uninterrupted prosperity. The Stated Meetings were made free to the public, and were well attended. The papers read were of both local and general interest, and five of them have been published in the "Transactions."

Many and valuable additions, both by purchase and donation, have been made to the Library and Museum, including about one hundred and fifty volumes of the serials, which have been bound, and are now in very general request. Though several invitations were given to members of the Society to enter in the "Recommendation Book" the titles of books suitable for the Library, very few availed themselves of the opportunity, and the Council had to depend on its own judgment, which they trust will be found to have been exercised to the advantage of the Society.

In consideration of the large increase in members, many of whom seem to have been mainly attracted by the convenience and comfort of the Library, the Council thought it expedient to place on the table, in addition to the valuable periodicals previously taken, the London, Parisian, and Canadian *Illustrated News*, and the London *Engineer*. While the Council have been disposed to go very far in this direction, they trust that it will never be forgotten that the chief objects of the Society, and that for which the Legislature votes its annual grant, is

for making researches into the early history of Canada, and for "receiving, procuring, and publishing interesting documents and useful information in connection with the Natural, Civil, and Literary history of British North America."

The expenditure has been large, much larger than was at one time contemplated, as within the past few weeks it was found necessary to proceed with the erection of a large glass-case in the centre of the Museum, which, in the opinion of the Curator, was rendered necessary, in order to prevent the destruction of some of our most valuable specimens in Ornithology, which were exposed in the Museum, and also for the better exhibition and classification of others. This has been effected at a cost of about $150, and, with the sums previously paid for specimens, has caused an expenditure for the Museum more than its due annual proportion. The Treasurer, however, after making provision for the payment of every claim against the Society, is still able to shew a balance to credit of $479.72.

The Treasurer's Account shews the state of the account for the year:

Revenue	$2,138 19
Expenditure	1,473 40
Balance	$664 79

The Balance is apportioned as follows:

Historical Document Fund	$130 42
Life Members' do.	54 65
General Fund	479 72
	$664 79

During the past year, the number of members was 209, of whom 195 are entitled to full privileges, having paid all dues. After striking from the list the names of all members who had left the city, who had resigned, or ceased to be associates from other causes, there now remain in full membership 202 members.

It was the intention of the Council to have completed, before the close of the year, the printing of the Catalogue of the Library; but, though the manuscript, after considerable unavoidable delays, has

been for some time in the hands of the printer, no progress has yet been made; but the printing will be proceeded with now, without further interruption.

The arrangement with Mr. Mathison, as the custodian of the Rooms, Assistant-Secretary, and sub-Librarian, continues to give every satisfaction; and the friendly and mutually advantageous position with Morrin College remains unimpaired.

WM. JAS. ANDERSON,

President.

PAPERS READ BEFORE THE SOCIETY.

1870.—January 5th—Rev. J. Douglas, President:—On the Physical Constitution of the Sun, and the Eclipse of August 7th, 1869.

" January 19th—Dr. Anderson, President:—On the Expatriation of the Acadians, or the Poetry and Prose of History.

" March 16th—Dr. Larue:—On the Gold, Copper, and Iron Deposits in the Province of Quebec.

" March 23rd—Dr. Douglas:—A Whaling Voyage to Spitzbergen, fifty years ago.

" March 30th—Bishop of Quebec:—On the Literature of Queen Anne's Reign.

" April 6th—Dr. Anderson, President:—On Murray's Despatch to Secretary Pitt on the Military Operations at Quebec, from the Capitulation by De Ramezay on the 18th September, 1759, to the raising of the Siege by De Levis on the 17th May, 1760.

" April 27th—Captain Ashe, Vice-President:—On the Eclipse Expedition of August, 1869.

REPORT OF THE CURATOR OF THE MUSEUM.

On taking charge, in January last, of the Natural History department of this Society, it became the pleasant duty of the undersigned to allude to several valuable contributions recently made to the Museum.

In reviewing the incidents of that year, it also became necessary to express regret at this Institution not having been in a position to take advantage of the very liberal offer made by a learned Professor of Natural History from Lyons, France, to exchange with us, for specimens of our *Fauna*, some three hundred species of European birds, natives of the Alps, Pyrenees, Jura, and sea-coast of France.

This gentleman had left in the possession of the undersigned these valuable specimens for purposes of exchange. The Laval University, the Normal School, and several owners of private collections, readily took advantage of this offer. It is, however, satisfactory to know that a great portion of these foreign birds now enrich the Museums in Canada.

Should ever a similar opportunity occur, the Society, by means of the duplicates of specimens in skins, which the undersigned has made it his business to procure, will be in a position to effect exchanges.

Amongst the benefactors of the Society conspicuously shines the name of a Quebecer, now promoted to an important position in England—John W. Bligh, Esq., M.D., C.M., M.R.C.S.E., &c., who forwarded to one of our oldest members, W. Marsden, Esq., M.A., M.D., one of our Vice-Presidents, several very handsome and rare birds from Australia and elsewhere. Thanks to him, students of Natural History can now find in our collection that famed wanderer of the Great Deep whose untimely end brought on the head of the "Ancient Mariner" such untold misfortunes. There stands before you, gentlemen, the Albatross, whose extent of wing sometimes measures as much as ten feet.

The want of suitable glass-cases, to exhibit our rapidly-increasing specimens, has been severely felt this summer: one or two large ones, which remained unprotected, have been eaten by moths and insects; but before further damage was done, the undersigned, under the

sanction of the Board, ordered the handsome, large centre-case which members now see in the Museum. This will afford what was indispensable—space to exhibit, classify, and preserve large birds, animals, and fishes. Though an expensive improvement, it was imperatively required; and no one, the undersigned believes, will be disposed to question its utility.

It is considered advisable to draw attention to the expediency of completing the collection of birds' eggs, which the Society began some years back.

Oology is a science which, though of comparatively recent birth, is rapidly increasing in favor, in America as well as in Europe. It has a very practical application as an auxiliary to classify birds, especially the birds of prey, whose real history is yet so imperfectly known. The variety of plumage in the hawk family, caused in a great measure by climate or age, has been a source of endless perplexity to naturalists. Oology, by the inspection of the size, form, markings and colour of the eggs of birds, has frequently afforded a clue to these mysterious changes in plumage, by fixing the species. Foremost amongst American oologists may be reckoned Dr. Thos. Brewer, of Boston, the publisher of a handsomely-illustrated volume on Oology. This science is also a favorite one in New York, Philadelphia, and Washington —every city, in fact, where large collections exist. A tabular classification of Canadian birds, with their Latin and English names, has also been procured by the undersigned, who looks forward to extensive additions to the Museum shortly. The study of Natural History, especially that department which treats of Ornithology, is particularly attractive and ennobling in its aim, making the mind familiar with some of the most lovely and loveable portions of the creation. Its pursuit, in bringing its votaries amidst the green fields, majestic woods, or boundless prairies of this continent, is healthy and manly. Nor can one find a higher or more eloquent tribute—paid by an able naturalist—to American birds, than the words of Alex. Wilson, who, though familiar in his youth with the birds of the old country, thus expatiates on those of America, the land of his adoption :—"The Ornithology of the United States exhibits a rich display of the most splendid colours, from the green, silky, gold-bespangled down of the minute humming-bird, scarce three inches in extent, to the black, coppery wings of the gloomy condor, of sixteen feet, who sometimes visits our northern regions,—a numerous and powerful band of

songsters, that, for sweetness, variety, and melody, are surpassed by no country on earth,—an ever-changing scene of migration from torrid to temperate, and from northern to southern regions, in quest of suitable season, food, and climates, and such an amazing diversity in habit, economy, form, disposition, and faculties, so uniformly hereditary in each species, and so completely adequate to their peculiar wants and conveniences, as to overhelm us with astonishment at the power, wisdom, and beneficence of the Creator.

"In proportion as we become acquainted with these particulars, our visits to and residence in the country become more and more agreeable. Formerly, on such occasions, we found ourselves in solitude, or, with respect to the feathered tribes, as it were, in a strange country, where the manners, language, and faces of all were either totally overlooked or utterly unknown to us; now, we find ourselves among interesting and well-known neighbours and acquaintances, and in the notes of every songster recognize with satisfaction the voice of an old friend and companion. A study thus tending to multiply our enjoyments at so cheap a rate, and to lead us, by such pleasing gradations, to the contemplation of the Great First Cause, the Father and Preserver of all, can neither be idle nor useless, but is worthy of rational beings, and, doubtless, agreeable to the Deity."

What more could be said of this noble science, after the stirring appeal of Alexander Wilson?

J. M. LEMOINE,

Quebec, 11th January, 1871. *Curator.*

DONATIONS TO THE MUSEUM.

Small Case of South-American Insects,—By Dr. W. H. Patton.

$85.65 in Confederate State Bills,—By the Hon. J. Fraser.

Two Loon Eggs,—By W. D. Campbell.

Greater and Smaller Albatross, 3; and two Petrels,—By John William Bligh, M.D., C.M., M.R.C.S.E.

A Button with the Initials I. R. A.,—By Dr. Brigham.

A Postage Card,—By Commander E. D. Ashe.

An Old Coin of 1672,—By G. Staton.

One Pair Moose Deer-Horns,—By H. McHugh.

REPORT OF THE LIBRARIAN.

When I submitted my last Report, as Librarian of the *Literary and Historical Society of Quebec*, I felt gratified in being enabled to mention the progress of the Library during the preceding year.

During the last twelve months, 120 volumes have been added: 82 were purchased by the Council; the remaining 38 were gifts from Members and Corresponding Members. Amongst the purchases, I may mention a master-piece of Canadian typography, the works of Champlain; two splendid volumes on Chemistry, by Dr. Sheridan Muspratt; the Treatise of Somerville on Molecular and Microscopic Science; the Report of the Canadian Eclipse Party in 1869; the *Life of the Duke of Kent;* the sequel of the useful publications of the Smithsonian Institute; and the precious gift of a Letter of Christopher Columbus, of which only 24 copies were printed, generously presented to the Society by its Editor, Mr. Edwin Tross, Paris. Side by side with this renowned French *bibliopolist* ought to be noticed, as benefactors of the Library, the Governments of Canada and Nova Scotia; the Commonwealth of Massachusetts; the Historical Society of Connecticut; the City Hospital of Boston; the Mercantile Library of New York; the Smithsonian Institute; Messrs. Roderick McLeod, L. Bertolotto, Dr. W. J. Anderson, John Harris, Charles Cowley, Dr. H. H. Miles, of Quebec; Hon. John Fraser, of Ste. Marie; General de Peyster, of New York. Mr. M. Stevenson also presented the Library with a very scarce book, enhanced in value by splendid copper-plate engravings. This rare work was published at Leyden in 1665, under the French title: "L'Ambassade de la Compagnie Orientale des Provinces Unis vers l'Empereur de la Chine."

During the past year, the number of books circulated amongst the members has been 1,938 volumes, being 439 more than the circulation of the preceding year.

Eleven new European and American Reviews and Magazines have been added to the thirty-three already on the table.

When the Catalogue, now being printed, shall be distributed, the Library will be complete ; and its 10,000 volumes, circulated amongst the public, and more appreciated by our fellow-citizens, will make it one of the most attractive and useful Libraries of this city, thanks to the magnificent collection of literary, historical, and scientific works spread along its shelves.

The whole respectfully submitted.

FAUCHER DE SAINT MAURICE,

Librarian.

Quebec, 11th January, 1871.

DONATIONS TO THE LIBRARY.

Books and Documents in French, 6 volumes,—By A. H. E. Faucher de St. Maurice.

Nova Scotia Archives, 3 volumes,—By Thomas B. Akins, Commissioner of Records, Nova Scotia.

Canada,—Catalogue of the Library of Parliament, 1857,—By Dr. W. J. Anderson.

Géologique du Canada, 1 volume,—By R. McLeod.

Scientific American, 1 volume,—By L. Bertolotto.

Phrenological Journal, 1 volume,—By L. Bertolotto.

Statutes of Canada, 1 volume,—By Government of Canada.

History of General Kearney, 1 volume,—By Gen. J. W. De Peyster.

C. E. Anderson's Gazetteer of Ontario, 1 volume,—By Dr. W. J. Anderson.

Report on the Invertebrata of Massachusetts, 1 vol.,—By the Commonwealth of Massachusetts.

Contributions to Knowledge, volume 16 ; Miscellaneous Collections, volumes 8, 9,—By the Smithsonian Institute.

Calendar of New York Historical Manuscripts, 2 volumes; Fifty-second Annual Report of the Trustees of the New York State Library, 1 volume,—By New York State Library.

Sessional Papers, volumes 3, 4, 1869,—By Dominion Government.

Historic and Antique Scenes of Brooklyn and its Vicinity, 1 volume,—By T. F. Field.

Sessional Papers, vols. 2, 5, 6, 1869, 1 vol.,—By Dominion Government.

Canada Eclipse Party, 1869, 1 volume,—By Captain E. D. Ashe.

Journals of the Senate, Canada, volume 3, 1870; Journals of the House of Commons, volume 3, 1870,—By Dominion Government.

Field's History of the Royal Society, 2 volumes,—By Dr. H. H. Miles.

Tales of the Sea, 1 volume,—By John Fraser.

Sessional Papers, 1 to 3, volume 3, No. 1, 1870; Sessional Papers, 6, 7, 8, 11, 12, 31, 1870, 3 volumes,—By Dominion Government.

Collections of the Connecticut Historical Society, 1 vol.,—By Connecticut Historical Society.

Medical and Surgical Reports, 1 volume,—By Boston City Hospital.

Literary and Historical Society of Quebec.

Abstract of the Treasurer's Account for 1870.

Dr.

1870.		
Jany. 12.—To Balance from last year:		
Historical Document Fund	$130 42	
Life Members' Fund	54 65	
General Fund	447 81	
		$632 88
To Received Government Grant		750 00
To " Interest on Deposits		29 31
To " from Subscribers		726 00
		$2138 19

Cr.

1870.		
By Paid for Books, Periodicals, &c	$559 43	
By " " Rent, Taxes, Insurance, &c	252 75	
By " " Salaries	213 38	
By " " Fuel, Gas, &c	102 96	
By " " Furniture and Museum	218 69	
By " " Sundry Expenses	126 19	
		$1473 40
By Balance on hand, as follows:		
Historical Document Fund	$130 42	
Life Members' Fund	54 65	
General Fund	479 72	
		664 79
		$2138 19

Quebec, January 7th, 1871.

(Signed,) T. H. GRANT, Treasurer.

Literary & Historical Society of Quebec.

LIST OF MEMBERS, 1871.

Life-Member :—THOMAS GLOVER, *Esquire.*

Associate Members.

Ashe, E. D., Comdr., F.R.S.
Anderson, W. J., M.R.C.S.
Ahern, W.
Andrews, F. H.

Bowen, N. H.
Bouchette, Jos.
Baillairgé, Chas.
Burroughs, J. H. R.
Bertolotto, L.
Baillairgé, L. J.
Baby, M. W.
Boswell, J. K.
Bossé, J. G.
Budden, J. S.
Belleau, J. F.
Bennett, Benson.
Blanchet, H.
Burstall, E.
Boswell, W., M.D.
Brown, W. P.
Boomer, J.
Bowles, G. J.
Bowles, J.
Blaiklock, F. W.
Bruce, R.
Blanchette, Hon. J. G., M.P.
Benson, W. P.
Bodkin, A. A.

Chauveau, Hon. P. J. O., M.P.
Campbell, W. D.
Cook, J. W.
Colston, J. G., B.A., L.L.M.
Chinic, Eugène.
Clark, Rev. W. B.
Caron, A. P.
Campbell, G.
Campbell, Arch.
Cassels, Robt.
Casgrain, P. B.
Charlebois, J. A.
Carlile, W. O., Lt., R. A.
Cook, W.

Dunbar, J.
Douglas, Dr. James.
Delagrave, C.
Dunn, W.
Doucet, P. A.
Dawson, S. J.
Dorion, L. E.
Dinning, H.
Douglas, Jas., Jr.
Drum, S. W.
Dunlevie, G. G.
Delaney, P.
Davies, W. A.

Fitzgerald, C. L. J.
Fraser, A.
Fry, H.
Fabre, Hector.
Fothergill, Rev. M. M.
Fraser, A.
Fry, J. S.
Foote, J. J.
Faucher de St. Maurice, A.H.E.
Fairchild, G.
Fraser, Hon. J.
Farley, A. M.

Grant, T. H.
Garneau, P.
Glass, Jno.
Goldstone, Geo., M.D.
Gilmour, Jno.
Gregory, J. U.
Gibb, Jas.
Glass, H.
Goodwin, J. W.
Globensky, B.
Gibsone, W. C.
Gibsone, J. F.

Hall, G. B.
Holt, C. G., Q.C.
Hossack, W.
Hossack, J.
Horan, J.
Hart, Geo.
Hunt, W.
Hamilton, R.
Hamilton, Rev. Chas.
Home, W.
Hunter, T.
Hemming, H.
Hall, G.
Hossack, J. F.

Irvine, Hon. Geo., M.P.

Johnsen, C. J.
Joly, H. G., M.P.
Johnstone, P.
Jackson, A. H.
Joseph, A.

LeMoine, J. M.
LeMoine, Gasp.
Langlois, Jean, M.P.
Ledroit, T.
Langlois, C. B.
LeSueur, P.
LeGendre, N.
Laird, J. U.
Lamontagne, E.
Lesage, S.
Lampson, F.
L'Heureux, O. E.

McGreevy, Hon. T., M.P.
Montizambert, C. N.
Marsden, W., M.A., M.D.
Moodie, W.
McNaughton, P.
Mountain, M. G.
Miller, M.
Maxham, A. J.
McNaughton, Jno.
Murphy, O.
McBlain, H.
McQuarrie, Rev. A. N., B.A.

Miles, H. H.
McLeod, R.
Mackedie, D. C.
Morgan, R.
McCord, T.
MacLeod, D. R.
Montpetit, A. N.
Motz, J.
McHugh, L. H.
McCallum, W. C.
Martindale, Col. B. H.
Maclaren, W. M.

Neilson, Jno.
Nott, J. F.

O'Meara, D. D.

Peebles, P.
Peters, H. J.
Poston, W.
Paradis, O. E.
Patton, D.
Price, E. J.
Peters, S.
Pope, E.
Parkin, E. B.
Plees, Rev. R. G.
Poston, C.
Powis, Rev. H. D.

Quebec, J. W., Lord Bishop.

Renault, A.
Richardson, O. L., Jr.
Renaud, J. B.
Roy, F. E., M.D.

Reynar, Jos.
Renfrew, G. R.
Rhodes, Col. W.
Rowand, A., M.D.
Rattray, D.
Robertson, A.
Ross, J. G.
Ross, N. N., Jr.
Richardson, W. C.
Ross, J.

Scott, H. S.
Shaw, R.
Stevenson, M.
Sheppard, W. G.
Sewell, J. A., M.D., Jr.
Stevenson, J.
Simons, W.
Shaw, P. A.
Smith, H. S.
Smith, C. F.
Smith, R. H.
Stanley, W., Jr.
Stewart, Hon. A., Judge.
Sheppard, H. C.
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N. B.—The Manuscripts and Transactions of the Society may be obtained on application to the Librarian at the Library.

DEED OF LEASE.

MORRIN COLLEGE

TO

THE LITERARY AND HISTORICAL SOCIETY OF QUEBEC.

On the fifth day of March, in the year of our Lord one thousand eight hundred and sixty-eight, before us, the undersigned Notaries Public, duly commissioned and sworn for that part of Canada heretofore constituting the Province of Lower Canada, residing at the City of Quebec, personally came and appeared "Morrin College," a Body Politic and Corporate, established at the said City of Quebec under the provisions of the Provincial Statute 24th Victoria, Chapter 109, represented herein by the Reverend John Cook, D.D., of the said City of Quebec, first Principal and Chairman of the Governors of said College, who did declare to have leased and demised, and by these presents do lease and demise, for the space and term of ten years, to be computed from the first day of May now next ensuing, and fully to be complete and ended on the thirtieth day of April, which will be in the year of our Lord one thousand eight hundred and seventy-eight, unto "The Literary and Historical Society of Quebec," a Body Politic and Corporate, established at Quebec aforesaid under the provisions of the 10th and 11th George IV., Chapter 47, represented herein by William James Anderson, Esquire, M.D., of the said City of Quebec, one of the Vice-Presidents of the said Society, hereunto duly authorized, the said William James Anderson hereunto present and accepting hereof, that is to say:

Three rooms on the north side of the second flat of the building heretofore known as the Old Jail, and now being converted into a College building, said rooms to be finished according to the plans prepared by Mr. Peachy, Architect, and approved of by the said Society; together with the use of a suitable water-closet in the building, to be provided and kept in order and repair by the College, and also accommodation for housing fuel: said rooms to be ready for occupation on the first of May next, and to be used and enjoyed by the Society during this Lease as a Library, Museum, and Reading-Room, respectively, with free access thereto by the Members of the Society at all reasonable times; and with all which the said Lessees are content and satisfied.

And during all which period the said Lessors hereby promise and engage to cause the said Lessees to enjoy the said premises peaceably and quietly; to maintain the same in the landlord's repairs, and keep the same wind and water tight, according to law. And the said Lessees do hereby bind and oblige themselves to use and enjoy the said premises *en bon père de famille*, and maintain the same in all small and internal repairs; also, that they will observe all rules, regulations of Police, and all bye-laws of the Corporation of this City, which may concern the said premises hereby leased, in so far as the same may be incumbent upon Tenants; that they will pay, over and above the rent hereinafter stipulated, the water-rates which may be charged upon the said premises, proportionately to their rent; that they will keep the said premises furnished with moveables and effects sufficient to guarantee the payment of the rent hereinafter stipulated; that they will not sublet the same, in whole or in part, without the consent of the Lessors first had and obtained in writing; and that at the end and expiration of the present lease, and without any notice to that effect, they will surrender and deliver up the said premises in as good order and condition as they may receive the same, reasonable allowance being made for wear and tear.

The present Lease is thus made for and in consideration of the sum of one hundred and twenty dollars, current money of this Province, for each and every year of its duration, and which the said Lessees do hereby promise to pay unto the said Lessors, or bearer or bearers hereof, in and by equal consecutive quarterly payments, of the sum of thirty dollars each, the first of which shall be made on the first day of August next.

Moreover, it is expressly covenanted and agreed between the said parties hereto as follows, to wit:—1°. That should the said Society receive at any time during this Lease a Legislative grant of not less than four hundred dollars *per annum*, they shall be bound to pay in like manner to Morrin College an annual rental of two hundred dollars *per annum*, in lieu of the rent above stipulated, during the continuance of such Legislative grant; 2°. That either party will have the right of cancelling this Lease at the expiration of the first five years, on giving three months' notice in writing to the other party prior to the expiration of the said term of five years; and 3°. That during the term of this Lease, the Governors, Professors and Students of Morrin College will be entitled to have and are hereby granted the free use of the Library of the Literary and Historical Society, and also free access to its Museum in like manner as the Associate Members of the Society are entitled to use and enjoy the same.

And for the due execution of the present Lease, the said parties do hereby elect their domiciles, to wit: the said Lessors and the said Lessees at the premises above leased, at which places, &c., promising, &c., obliging, &c., renouncing, &c.

Thus done and passed at the said City of Quebec, in the Office of Noel Hill Bowen, one of us the said Notaries, on the day and year first above written, under the number three thousand seven hundred and eighty-seven. In Faith and Testimony whereof, the said parties hereto, respectively, acting and represented as aforesaid, have to these presents, first duly read, set and subscribed their names and signatures with us, the said Notaries, also hereunto subscribing; and the Seals of the said Corporate Institutions have been hereunto likewise affixed.

(Signed,) JOHN COOK,
[L.S.] Chairman.

WM. JAS. ANDERSON,
Vice-President,
[L.S.] Literary and Historical Society.

NOEL H. BOWEN,
I. NOLET, N.P. Notary Public.

A true copy of the original remaining of record in my Office. (One marginal note approved good, and twenty-two words erased are null.)

NOEL H. BOWEN, No. Pub.

Literary and Historical Society of Quebec.

THE WOODS OF CANADA.

"We are happy to learn that the Literary and Historical Society has, at a recent meeting of the Board, voted a sum of money to begin forthwith the collection of Woods in contemplation."—(*Quebec Morning Chronicle, January 20th*, 1871.)

(*To the Editor of the Morning Chronicle.*)

SIR,—I was pleased to see noticed in our city press the efforts of the Directors of the Literary and Historical Society to keep track with the rest of the scientific world in every department of study which is within its province. You may rest assured it is the intention of every member that our institution shall be second to none in Canada, as well by its Library as by the collection of birds, animals, fishes, eggs, &c., in its Museum. The large amount appropriated to this purpose, recently, is a sufficient earnest of such an intention. In the name of the Society, I cheerfully thank its numerous benefactors for rare books, handsome specimens of Natural History, and some natural curiosities.

The newest books of travel will be constantly ordered from Europe or the States. Canadian authors will also bear in mind that there is a portion of the Library exclusively devoted to the works of Canadians, written in the English or in the French language. The Society is particularly desirous to complete this collection, either by donations or by purchases.

Steps will be shortly taken to enlarge the mineralogical department; and I, among many others, am most anxious to see in our Museum, as suggested, an elaborate collection of Canadian woods.

In order to invite new members to join, it is now contemplated to bring before the Board a plan to open on some nights the rooms for those amongst our fellow-citizens who cannot call for books during the day. Our Library is now, after the Laval University, the most select, the most numerous, the most valuable, in Quebec: there are upwards of thirty English, French,

American, and Canadian Reviews and Magazines on the table. The annual subscription, which formerly was $8, has been of later years reduced to $4; so that, if our fellow-citizens, of all origins, will continue to this ancient and flourishing Institution the cordial support extended to it for some time past, there is no reason why the list of paying members at the end of the year should not reach the figure of 300.

It is expected of every member that he will point out to his friends the advantages presented by our Library of 10,000 volumes, &c., for debating societies and private individuals, in order, by enlisting them as members, to secure their co-operation.

J. M. LeMOINE,
President.

Quebec, January 21st, 1871.

LITERARY AND HISTORICAL SOCIETY OF QUEBEC.

Transactions and Manuscripts of the Society.

The following "TRANSACTIONS" and MANUSCRIPTS, published by the Society, may be had on application at the Library:

TRANSACTIONS,

For the years 1832; 1843; 1854; 1855; 1862; 1863; 1863-4; 1864-5; 1865-6; 1866-7; 1867-9; 1869-70; 1870-71.

Manuscripts of the Early History of Canada.

"Campaign of Louisbourg, 1750-58."—By Chevalier Johnstone.

"Journal of the Expedition up the River St. Lawrence, 1759."—From the "New York Mercury," December, 1759.

"Colonel Malcolm Fraser's Journal of the Siege, 1759."

"Journal du Siège de Québec en 1759."—M. Jean Claude Panet.

"Dialogues of the Dead: Montcalm and Wolfe."—Chevalier Johnstone.

"Campaign of 1760 in Canada."—Chevalier Johnstone.

"Invasion of Canada, 1775."—Lieutenant-Colonel Caldwell.

"Mémoire du Sieur de Ramezay, Commandant à Québec, 1759."

"Histoire du Montréal."

"Voyage D'Iberville."

"L'Armée Américaine, lors de l'Invasion du Canada en 1775-6."—Par J. B. Badeaux.

TRANSACTIONS

OF THE

Literary and Historical Society

OF QUEBEC.

SESSION OF 1871-72.

NEW SERIES.—PART 9.

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GENERAL PRINTING ESTABLISHMENT.
1872.

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TRANSACTIONS

OF THE

Literary and Historical Society of Quebec.

SESSION OF 1871-72.

PAPER I.—SOUTHERN AFRICA AND THE KAFFIRS.

BY R. E. ROBERTSON, ESQ., MAJOR, H. M. 60TH RIFLES.

(*Read before the Society, May 17th, 1871.*)

WHAT I propose reading to you this evening is taken partly from notes, and partly from recollections of my life, during two years I spent amongst the Kaffir tribes of southern Africa, as a government political agent. I will try to be as little egotistical as possible; but in reading notes from journals kept for my own private amusement, I am afraid you may find them rather like Dr. Johnson's dictionary, a little unconnected; and a good deal about self is likely to creep in, which I hope you will excuse.

There are several subjects I wish to touch upon, in order to give you an idea of life in South Africa, and the different races of mankiud you meet there; but you will understand that the limits of a short lecture will only admit of my remarks being *very* sketchy upon any of them.

In the year 1856 I was ordered to join the 2nd battalion of the 60th Rifles, then quartered in British Kaffraria, and sailed from Cork in the stormy month of March, in H. M. S. *Penelope*, Captain Sir Wm. Wiseman. Seven days of the usual amount of cold, sea-sickness, and discomfort, brought us to Madeira; and I may remark, in passing, that a man-of-war is not a convenient place to be ill in. If you have no cabin (I had none), you are apt to find yourself a good deal in people's

way, and perhaps hunted by some stout hirsute official touching his hat, and requesting you "not to be sick on that gun;" or, "Please, sir, this is the captain's side of the deck, and you can't be sick here." However, when you get your "sea-legs," you appreciate very much the perfect order and discipline of H. M.'s navy, especially when your ship is commanded by a captain like Sir Wm. Wiseman. We anchored close to the town of Funchal, the capital of the island, beautifully situated on the side of a mountain which rises from the sea. You have all heard of the salubriousness of the climate, and how beneficial it is for patients suffering from pulmonary complaints. The island is also celebrated for its wine and sweetmeats, all kinds of fruit being here candied in the most exquisite perfection. A few days, not more, can be spent here very pleasantly: the principal excursion is to the Curaal, a beautiful valley in the mountains, about seven miles from Funchal. There is a small garrison of tidy-looking Portuguese soldiers at Funchal. On leaving Madeira, you will probably be surprised to hear that our shortest way to South Africa was via South America—at least so said our captain, Sir Wm. Wiseman; and about twenty-three days' sailing and steaming brought us to Rio Janeiro, situated on one of the largest and perhaps the most beautiful harbour or bay in the world,—studded with lovely islands, clothed with trees of various hues of foliage, including the graceful palm, which grows to a great size in this tropical country. The fertility everywhere in this part of the world was quite marvellous to behold; and here, for the first time in my life, I saw slaves at work in the fields. The country produces cotton, sugar, rum, coffee, cocoa, pepper, indigo, rice, and tobacco, with abundance of the delicious fruits of South America, and garden-stuff, but no bread-corn. It has numerous mines of gold, and precious stones are to be found in great quantities. We were there in the month of April, the winter time in those parts; and the climate, though hot, about the temperature of a summer-day in Quebec, was pleasant enough. After spending a

week at Rio, we proceeded on our way, and reached the Cape of Good Hope, taking no more short-cuts, in about three weeks. The Cape is situated in long. 18.23 E., lat. 33.50 S., and, like Madeira, is admirably suited for consumptive patients. The climate of our vast possessions in this country is unsurpassed (and I question if equalled) by any in the world. Numbers of Europeans, whose constitutions had been impaired by an Indian climate, used to come here at one time; but since the journey to Europe has been so much shortened by the overland route, it has been almost deserted by East-Indians. It is a climate in which you can do anything, summer or winter. However hot the day may be—and it is sometimes very hot—still, the atmosphere never has that steamy, debilitating feeling so well known in India; and a pleasant, cool night always follows the hottest day. You may sleep out of doors at night without thinking of cold or rheumatism. The winter is generally dry. I have seen snow fall, but it never lies for more than a few hours. The Cape belonged for 143 years to the Dutch, and, after various vicissitudes, was finally ceded to the British at the congress of Vienna, in 1815. The form of government is similar to that of this country. There is a governor with a salary of five or six thousand a year, and a lieutenant-governor. The parliament hold their sittings at Cape Town. As a naval station, the Cape was considered at one time important. Homeward-bound ships from India generally touched there; but the opening of the Suez Canal will, I fancy, make a great difference to it in this respect. It is inhabited by a very mixed population, composed of Dutch, (or Boors, as they are called,) English, Hottentots, Fingoes, Kaffirs, and Bushmen. With the Kaffirs my experience is chiefly connected. On my arrival, I proceeded at once to join my battalion in Kaffraria, going round in the *Penelope* to Buffalo-mouth, where we landed. Here, many of the names of places indicate the former existence of large game, such as Buffalo-mouth, Eland's Post, Leo Fontain, &c., &c. The country, for the most part, consists of extensive

undulating plains, covered with long coarse grass. There are two descriptions of this grass, called sweet velt and sour velt: the former is good pasture for cattle, but the latter is only fit for game. There are no lofty mountains, though the Amatolas and other small ranges are very beautiful. Inland communication is difficult for the purposes of trade, as there are no navigable rivers; and the absence of natural harbours, and the great difficulty of landing anywhere along the coast, even at Buffalo-mouth, on account of the heavy surf, will, I am afraid, prevent the country from ever attaining to any great commercial prosperity. But the emigrant there has very few difficulties to overcome, in comparison with this or other countries. In the first place, the climate is perfect all the year round; the ground is not more encumbered than is sufficient to embellish the scenery and to supply timber fuel; the soil is ready for the plough, and in many places is so fertile that you might almost grow ten-penny nails into iron crow-bars. The pasturage is abundant throughout the year for all descriptions of stock, and unoccupied lands, almost boundless, extend themselves in every direction. Of late years, I believe, cattle and sheep farmers have been very successful; and large quantities of wool are now produced, which compete successfully with the Australian produce in the London market. There is also a large export trade in hides and horns. Last year, South Africa shipped 5,802 diamonds: they are said to be of an inferior quality, though they brought $861,777 in money. Cattle of all kinds seem to thrive well. The first emigrants found the natives of the Cape in possession of prodigious herds of fine cattle: these are supposed to have come from the north-east, for from this point the native Hottentots ascribe their original migration. They brought cattle, sheep, goats and dogs, but no horses or asses. The Cape and Kaffraria are now celebrated for good horses; but many of them have a most disagreeable and dangerous trick of bucking, and I defy the best horseman in the world to sit an inveterate Cape bucker. The rough rider of the Cape Mounted Rifles was a first-rate horseman, and

could sit a bucker longer than most people; but I remember a very handsome little horse, the property of an officer, sending him flying over his head, and then bucking the saddle off, getting rid of it by pulling his head and fore-legs through the girths. I was thrown several times, till I learnt by experience to ask the question, "Is he a bucker?" before mounting a strange horse. The last Kaffir war had been over about two years when I arrived in Kaffraria; but a great deal of irritation existed along the frontier: murders were committed from time to time, and constant raids were being made by the Kaffirs, who carried off cattle from the frontier farmers. Things were in a very unsatisfactory state, and an outbreak was constantly expected. Sir George Gray, who had a high reputation as a colonial governor, and had been very successful in his dealings with the disaffected native tribes in New Zealand, was at this time governor of the Cape, and he now organized a scheme for controlling the Kaffir chiefs. He divided British Kaffraria into four districts, and directed Sir James Jackson, commanding the troops in South Africa, to select four officers from H. M. regiments to take the political charge and supervision of these districts. I was fortunate in being one of the officers selected for this duty, and was posted to a district situated between the Kie and the Thomas river, about twenty miles from Queenstown. My duties were chiefly acting as a magistrate and representative of the English government with the chiefs, and to control their patriarchal authority amongst the people. I was also a Justice of the Peace, with power to act in the colony and to arrange disputes between the frontier farmers and the Kaffirs. But Sir George Gray's primary object in sending us into Kaffirland was to break up the power of the chiefs by English influence and a little English money judiciously introduced—that very powerful stimulant for good or evil. I may remark here that the Kaffirs are divided by themselves into various subdivisions, as the Amakosa, Amaponda, Basutos, Tambookies, &c., &c. Where they come from, originally, I do not know; but it is evident that they are not the aborigines

of Southern Africa. I have heard it supposed that they are the lost tribes; and as many of their customs are very Israelitish, this descent may not be improbable. The Basuto division is, I fancy, the most advanced in civilization—at least their great chief, Moshese, is a very enlightened barbarian, and anxious to do his best to improve his people. He sent his sons to be educated in England, and he has built himself a house in the European style, though I believe he prefers living in a Kaffir hut. The Zulus of Natal belong to the same family, and are as famed for their honesty as my friends on the colonial frontier are renowned for cattle-lifting.

I had to deal directly with two of the principal chiefs, by name Anta (*alias* Kiimpie), the warrior, and Oba (*alias* Goniama, or the lion). Anta was a very fine specimen of the human race, and one of the largest men in Kaffirland. I think his height was about 6 ft. 4 in.; but, though a very powerful man, his limbs did not seem remarkable for much muscle. He had very pleasant features, full of good humour; and when he could get it, which was pretty often, the humour was a good deal heightened by Cape smoke, a vile composition made from an inferior Cape grape. He had the reputation of being the best fighting chief in Kaffraria, and during the war gave us a great deal of trouble. He was half-brother to Sandillie, a well-known chief in the Kaffir war. Oba was also a fine-looking young man, and a much sharper fellow than Anta: he was tall and slight, particularly good-looking, with fine eyes, and a very high-bred, open, manly manner. Indeed, this description of his manner applies to that of most Kaffirs. A stranger is always much struck with the easy and noble carriage of the men and their peculiarly graceful demeanour: they are always perfectly at their ease; and a Kaffir, when he wishes, can be amongst the most dignified of mankind; he never troubles himself about asserting his dignity, and he is undoubtedly one of nature's gentlemen. Oba was higher in rank than Anta, and

his tribe was at least twice the size. Of his counsellors, eight or ten had been the influential counsellors of Gaika, and also higher in rank than Anta's. He was in bad health at this time, and thought himself bewitched. I was anxious for him to go with me to King William Town, about fifty miles off, to see our regimental doctor; but he seemed to have no confidence in European wisdom: he thought our witchcraft was different from theirs, and, therefore, an English doctor could not cure him. At the same time, he was very anxious that I should bring him a bottle of cod-liver oil, in which he seemed to put much faith. He was very interesting, and I took a great fancy to him, and did my best to be friendly and on good terms with him; but he never took kindly to me or to Sir George Gray's scheme, and, indeed, after a time he refused to receive the monthly subsidy I paid the chiefs. Of course, all our power over the tribes lay through the chiefs, and this subsidy was at first the mainspring of it.

The Kaffir chiefs, like more civilized men, are fond of the ladies, and my chiefs were no exception to this rule, each having a good many wives: Anta had six. Marriage is usually contracted very early amongst the Kaffirs; but, unlike the mercenary white men *there*, it is useless for the young marrying man to wonder if the lady of his affections has, or is likely to have, any money, for the beautiful princess, or the interesting maiden, must be bought from the cattle-loving father. She is always paid for in cows, the price depending a good deal upon her birth and condition. This plan seems to answer very well, for I never heard of the Kaffir father having any difficulty in getting his daughters off his hands. The Kaffirs are very aristocratic in their ideas; they are proud of genealogy and fond of relationship to great families. Not possessing any written documents, their traditionary legends are all oral; but they can, nevertheless, count their grandfathers on their fingers for at least 150 or 200 years. The principal,

or, as they call her, the right-hand wife of a chief, is always a lady from the Royal tribe of the Tambookies, and her son inherits the hereditary chieftainship. They generally treat their wives and children very kindly, though it is difficult to reconcile this with making them do all the hard work, such as digging the ground, constructing huts, and a variety of other employments. There is a story of a missionary remonstrating with a Kaffir for throwing all the hard work upon his wife and doing nothing himself, and endeavoring to strengthen his position by mentioning the manner in which Europeans treated their wives; but he met with little success in his argument. The Kaffir's reply was sufficiently to the point: "White men do not buy their wives, and the two cases are not parallel." The divorce court is a very simple business, for if a woman runs away from her husband, or is unfaithful to him, he can demand from her father the price he paid for her, and there is an end of the matter.

Between married persons and their relatives a very singular code of etiquette prevails. In the first place, a man is not allowed to marry any one to whom he is related by blood. He may marry two or more sisters, provided they come from a different family from his own; but he may not take a wife who is descended from his own particular ancestors. A man may not only marry the wife of a deceased brother, but considers himself bound to do so in justice to the widow and children of his brother, who then become, to all intents and purposes, his own. After a man is married, it is contrary to etiquette to speak to his mother-in-law, except at a great distance. Perhaps this is a mistake; but if so, it is on the right side, for a Kaffir has generally a considerable number of mothers-in-law, and the rule is, doubtless, a very good one. So far is this peculiar etiquette carried, that if the man and his mother-in-law meet in a narrow path, they must always pretend not to see each other. The woman generally looks out for a convenient bush and gets behind it, and the man passes, carefully turning his head in the other direction. One

of my chiefs was very anxious to form a matrimonial alliance with an English family of position; and some one induced him to offer twenty head of cattle for Miss Pringle Taylor, the only daughter of General Pringle Taylor, commanding the troops in Kaffraria at that time, who had the bad taste to decline the offer. My friend was a little surprised at the rejection of so good a *parti;* but, like my worthy countryman, he consoled himself with the thought that "she was daft to refuse the laird of Cockpen." From hard work the women are inferior in appearance to the men, though their figures are remarkably good when young, and the very airy dress they wear serves to shew them off to the best advantage. In full dress they wear long black cloaks made of ox-skins, ornamented with beads, brass, and pieces of polished copper, and generally the shell of a small tortoise suspended from the neck of the cloak, hanging down the back; they also wear a short leathern petticoat. They are all admirable dressers of furs, and the skins they wear are as soft and pliable as our winter coats in this country. They use a good deal of milk and butter in preparing the skins. The chief is generally distinguished from his people by a carosse of tiger's skin. He decorates his arms with quantities of polished brass rings (as do the women), and wears a necklace of tiger's teeth. In British Kaffraria, his usual dress is a dark-red blanket—in fact, this is the only dress worn by the men now-a-days, and is fastened over the shoulder of the naked arm, while the other side is wholly concealed. But in their kraals most of them go about quite naked, excepting a little leathern bag, called a *nuchie*, from which an ornamental thong depends down to the knee. Sir George Gray, being anxious to introduce civilization, gave an order that only Kaffirs in decent clothing should be allowed to enter King William's town. I remember a very fat man, thinking himself hardly treated, being refused admittance by the police, after having, as he considered, got himself up rather well in military costume, which consisted solely and entirely of a very tight-fitting red shell-jacket. When away from home they usually

carry three or four assagais, light javelins about four or five feet long, armed with sharp iron knife-like heads. This weapon they use in hunting and war, and they can throw it a distance of 30 or 40 yards, with great accuracy of aim. In throwing it, they make a run, and discharge it with the aid of the jerk of stopping, giving it an upward direction in the discharge, so that it comes down on the object with accelerated force. The following passage, describing the dress and appearance of the Kaffir, is taken from Rose's *Four Years in South Africa:* "The chief is generally distinguished from his followers "by a carosse of tiger's skin, and by a tasteful beaded band "worn round the head; and when he stands surrounded by "his armed attendants, wrapped in their dark cloaks, it "forms a most imposing sight, and one which, though my "expectation had been raised, surprised me. Their figures "are the noblest that my eye ever gazed upon, their "movements the most graceful, and rheir attitudes the "proudest, standing like forms of monumental bronze. I "was much struck with the strong resemblance that a group "of Kaffirs bears to the Greek and Etruscan antique remains, "except that tbe savage drapery is more scanty, and falls in "simpler folds; their mantles, like those seen on the figures "of the ancient vases, are generally fastened over the "shoulder of the naked arm."

The men, however, are very nearly as idle as these figures on the ancient vases; but they occasionally occupy themselves in hunting, fighting, politics, and looking after the cattle, and frequently stealing other people's. In fact, the description given by Macaulay of the Scotch Highlanders in 1689 very well describes the Kaffir of the present day. Their dislike to manual labor, throwing the heaviest part on the weaker sex; their dwellings, too, in which a traveller would sometimes find his lodging in a hut, of which every nook swarmed with vermin—(I must say, however, that the Kaffir, though he is fond of a flea-hunt, and the game is sometimes plentiful, is by no means an uncleanly animal,

and I never saw vermin in their huts); a supper of grain it only for horses, and his bed always the bare earth, wet or dry, as the weather might be; their lawless practices, too, n the way of "cattle-lifting," are much the same. The ollowing lines, on the first Highlander that God created, pply so well to the Kaffir, and his sentiments on the ubject, that, perhaps, you will permit me to repeat them:

"Says God to the Heighland-man,
'Quhar wilt thou now?'
'I will down to the Lowlands,
Lord, and there steal a cow.'
'Fye,' quod St. Peter; 'thou wilt
Nere do weel,
An thou but new-made, so sune
Goes to steal.'
'Umph!' quod the Heighland-man, and swore by yon Kirk,
'So long as I may get to steal
Will I never work.'"

However, time and civilization have made an honest man f the Highlander; so we may hope it will do the same for he Kaffir.

In their own open country they have hunted nearly all the ame to death, their mode of hunting being very destructive. They spread themselves far and wide over the country, forming large circle, which is gradually contracted till the game are nclosed within a narrow space, where they kill great numbers vith their dogs and assagais. They are very dexterous in hrowing the kerrie, which is a stick of rather heavy wood, vith a knob at the end. I remember feeling rather small after iring at and missing a partridge (called, in Kaffir, insequatchie) o find my eye wiped by a Kaffir-beater bringing my bird own in its rapid flight by throwing his knob-kerrie at it.

I don't think the Kaffirs have any knowledge of a God, which is strange, as nearly all savages believe in something. They certainly have no form of worship, or of idols, or of rayers, or sacrifice. It seems almost impossible to make hem comprehend the doctrines of the Christian religion.

One would think that they ought to be easily converted, as they have no prejudices or preconceived ideas on the subject. It is, however, difficult to give an idea of the little effect teaching produces. They listen with respect and attention to what you tell them, but it seems not to make the least impression, and the idea of praying to an unseen Being appears to them perfectly ridiculous. The devil is also a sad stumbling-block, and they think it would facilitate their conversion very much if he could be first converted himself, or, at any rate, induced to mend his ways. A missionary I located amongst them was very popular as long as he confined his instruction to playing tunes on the fiddle and could give the children something to eat. However, I am thankful to say they did not eat him, as the New Zealanders did the missionary that was sent to them, and told the bishop when he came his rounds that they liked him very much. There is a story told by Dr. Livingstone of how he converted a chief, but found some difficulty in converting the rest of the tribe; and the chief one day remarked to him: "Do you imagine these people will ever believe by your merely talking to them? I can make them do nothing except by thrashing them, and if you like I shall call my head-men, and with our litupa (whips, made of rhinoceros hide) we'll soon make them all believe together."

Anta and three or four of his head-men were sitting in my hut one day, and appeared to be very much interested in my Bible, which they examined with much curiosity and awe, inside and out, when I told them it contained God's word; and I really thought my teaching was making some little impression, till Anta, in a very unconcerned voice, said: "A-awa incose, incoolu; bassaila cuba"—which means, "All right, chief; give me some tobacco." The word "bassaila" is, literally, "give me a present," and is used by the Kaffirs as a form of salutation. As we say, "How are you?" or "a fine day," they say, "bassaila." I was always addressed as "incose," or chief. But that individuals amongst them

have been converted to Christianity there is no doubt, for I have heard a Kaffir preach an admirable sermon, and, much to my astonishment, with a strong Scotch accent. I found out afterwards that he had been educated in Glasgow. But one thing they do believe in is witchcraft, for which the punishments are dreadful. The accused is generally a rich man, possessed of many cattle; and, guilty or not guilty, if accused by the witch-doctor, the wretched creature is convicted and summarily punished. Sometimes he is fixed to the earth over an ant-heap, by a thong carried round the ankles and wrists, which are fastened to stakes driven into the ground; he is then left in the sun, where he is quickly eaten up alive by those multitudinous insects. His cattle and wives are confiscated and divided between the chief and his counsellors, part going to the person he is supposed to have bewitched. But you will not be surprised at this dreadful superstition amongst these poor pagans when you remember that it is barely 200 years since the criminal tribunals of Europe were continually occupied in similar trials, and condemned to quite as awful punishments the wretched victims of a creed that taught the possibility, or, rather, actual fact, of infernal and human connection. Death by burning and drowning were the common penalties observed from the most ancient times throughout Christendom. The only case of superstition that came before me was that of a woman, who rushed wildly into my camp, in the greatest state of grief and excitement, to claim my protection, saying that she was accused of being a witch, and her husband said she must die. I at once sent for Anta, and cautioned him that in the event of any ill-treatment to the woman, I should hold him personally responsible. This, I think, had the effect of exorcising the evil spirit, for I heard no more about it.

How ruthlessly cruel a Kaffir can be when he is excited by the fear of witchcraft, can be imagined from the following account of the trial and execution of a supposed wizard. The reader must, moreover, be told that the whole of the

details are not mentioned. The narrative is taken from Major Ross King's interesting "*Campaigning in Kaffirland*," a work which describes the Kaffir in 1851-2. Kona, whose illness was the cause of the fearful scene I am about to read, was a son of Macomo, the well-known Kaffir chief who resisted the English forces for so long a time. I was personally acquainted with Macomo, who was one of the most astute old scoundrels in the world:—"The same Kona, some years before, having fallen sick, a 'witch-doctor' was consulted, according to custom, to ascertain the individual under whose evil influence he was suffering; and, as usual, a man of property was selected, and condemned to forfeit his life for his alleged crime. To prevent his being told of his all by his friends, a party of men left Macomo's kraal early in the morning to secure the recovery of the sick young chief by murdering one of his father's subjects. The day selected for the sacrifice appeared to have been a sort of gala day with the unconscious victim: he was in his kraal, had just slaughtered one of his cattle, and was merrily contemplating the convivialities of the day before him, over which he was about to preside. The arrival of a party of men from the 'great place' gave him no other concern than as to what part of the animal he should offer them as his guests. In a moment, however, the ruthless party seized him in his kraal. When he found himself secured by a rheim round his neck, he calmly said: 'It is my misfortune to be caught unarmed, or it should not be thus.' He was then ordered to produce the matter with which he had bewitched the son of his chief. He replied: 'I have no bewitching matter; but destroy me quickly if my chief has consented to my death.' His executioners said they must torture him until he produced it; to which he answered: 'Save yourselves the trouble, for, torture as you will, I cannot produce what I have not.' He was then held down on the ground, and several men proceeded to pierce his body all over with long Kaffir needles. The miserable victim bore this with extraordinary resolution, his tormentors tiring and complaining of the pain it gave their

hands, and of the needles and skewers bending. During this time a fire had been kindled, in which large flat stones were placed to heat. The man was then directed to rise; they pointed out to him the fire, telling him it was for his further torture unless he produced the bewitching matter. He answered: 'I told you the truth when I said, *Save yourselves the trouble.* As for the stones, I can bear them, for I am innocent. I would pray to be strangled at once, but that you would say I fear your torture.' Here his wife, who had also been seized, was stripped perfectly naked, and cruelly beaten and ill-treated before his eyes. The victim was then led to the fire, where he was thrown on his back, stretched out with his arms and legs tied to strong pegs driven into the ground, and the stones, now red hot, were taken out of the fire and placed on his naked body, on the groin, stomach, and chest, supported by others on each side of him, also heated and pressed against his body. It is impossible to describe the awful effect of this barbarous process, the stones slipping off the scorched and broiling flesh, being only kept in their places by the sticks of the fiendish executioners. Through all this the heroic fellow still remained perfectly sensible; and when asked if he wished to be released to discover his hidden charm, said, 'Release me.' They did so, fully expecting they had vanquished his resolution, when, to the astonishment of all, he stood up a ghastly spectacle, broiled alive! his smoking flesh hanging in pieces from his body, and composedly asked his tormentors, 'What do you wish me to do now?' They repeated their demand, but he resolutely asserted his innocence, and begged them to put him out of his misery; and as they were now getting tired of their labour, they made a running noose on the rheim around his neck, jerked him to the ground, and savagely dragged him about on the sharp stones; then, placing their feet on the back of his neck, they drew the noose tight and strangled him. His mangled corpse was taken into his own hut, which was set on fire and burnt to ashes. His sufferings commenced at 10 A.M., and only ended at sunset."

It seems strange that the Kaffir should act in this manner: naturally, he is by no means of a vindictive or cruel nature. Hot-tempered he is, and likely enough to avenge himself when offended by a blow of a club or the point of an assagai; but after the moment has passed away, his good humour returns, and he becomes as cheerful and lively as ever. Even in war, he is not generally a cruel soldier, when not excited by actual combat. The fact is, this conduct shews how great is his fear of the intangible power of witchcraft. Fear is ever the parent of cruelty; and the simple fact that a naturally kind-hearted and good-tempered man will lose all sense of truth, and inflict nameless tortures on his fellow, shews the abject fear of witchcraft which fills a Kaffir's mind. Their other superstitions are less hurtful, and some of them almost approach religion. A Kaffir selects as his guardian the spirit of some former chief or friend; invokes him on all occasions of difficulty; thanks him on all escapes from danger; sacrifices to him part of the ox he kills, part of the game that he takes; and in harvest-time, scatters a portion of the grain as an offering. In crossing a ford, or a drift, as it is called, he calls upon him. And I know of few places where a little spiritual assistance is more requisite at times; for when you get into the middle of one of these flooded drifts (for there are few or no bridges in the country), and your floundering horse loses his footing among the great stones at the bottom, you are very apt to be carried down stream, past the landing-place; and when the banks are high and rugged, it is a very nasty business getting out again. Colonel Nesbitt, who commanded the 2nd battalion 60th Rifles at the Cape, was drowned in this way. When a kraal is struck by lightning, the site is either deserted or an ox is buried beneath it as an offering to the incensed spirit of the kraal. The apparition of the dead shulanga is supposed at times to haunt a kraal when his dying wishes have not been complied with, and an ox is sacrificed to appease it, and a man rushes from the hut, in wild pursuit of the dark shadowy bogie. When the wife of a Kaffir dies, he becomes unclean,

leaves his kraal, and lives in the bush for a certain time; and on his return, puts on a fresh carosse, burning that in which he had mourned. When a chief dies, they generally wall up the body in his hut, and desert the kraal. They also adopt this method of disposing of very old people when they don't seem inclined to make a natural exit.

On taking up my residence amongst the Kaffirs, I located my party, consisting of an interpreter, a soldier servant, a Kaffir groom, and four or five horses, about three miles from Anta's kraal, and about thirty miles from the nearest military post. The situation was a good one in case of having to beat a hasty retreat into the colony. My tents were pitched at the foot of a mountain rejoicing in the euphonious name of the *Windvogelberg*, called after a bushman who had lived on it. The country about was pretty, and well stocked with game, principally hartebeests, quaggas, antelopes, spring-buck, an odd lion now and then, and ostriches, but all exceedingly wary, from being much hunted; there was also no end of small game. I had several very exciting gallops after ostriches, but never succeeded in killing one, though I have ridden into a string of them once or twice by making a cross-cut to their undeviating course. The only time I ever had a very good chance of getting one, I had succeeded in riding into a string of eight very fine birds, and was going at a great pace beside them; but, in the excitement to get a near shot, I threw myself off the horse without pulling up, and my foot catching in the rein gave me rather a severe fall. No horse can keep pace with them for more than a few minutes, their average speed being from twenty-six to thirty miles an hour. We caught a few young ones, which were easily tamed. My servant had an ostrich egg on tap, like a beer-barrel, for some days, and used to run it off for omelets; but it had a strong, disagreeable flavour, and required a very keen appetite to appreciate it. These eggs are constantly found lying about forsaken all over the country, as the ostrich begins to lay her eggs before she has fixed on a spot for a nest, which is only

a hollow a few inches deep in the sand, and about a yard in diameter. The flesh of the bird is white and coarse: parts of it are said to be good eating; but my recollections of how I got my teeth into it, and with some difficulty out of it, are not pleasant.

The noise the ostrich makes is singularly like the roar of the lion—indeed, few people can detect any difference at a little distance. The ostrich, however, roars only by day, and the lion by night. The male bird is of a jet-black glossy color, with the single exception of the white feathers, which form a considerable export-trade from South Africa. In the moulting season you can pick up quantities of these feathers, white and black, but more of the latter, scattered over the flats. The hen ostrich is of a dark-brownish, gray color, and so are the half-grown cocks. The young squat down and remain immoveable when too small to run far, but attain a wonderful degree of speed when about the size of common fowls. We had twelve or fourteen young ones at Windvogelberg, but they all died with the exception of one, which became very tame, and was a pet about the camp. A kick from an ostrich, when vigorously applied, will break a man's leg; but you will not think this very wonderful when you consider that the thigh of this bird is, if anything, rather larger, and quite as muscular as a horse's fore-arm.

The spring-bock, so called from its mode of progression, is a very beautiful creature. It is never met except in large herds. In my part of the country I have seldom seen more than a few hundreds together; but further north, a herd will amount to the number of nine and ten thousand. Its usual pace is that of a constant jumping, with all four legs straight off the ground at the same time. I used to find great amusement, when riding a good horse, in getting as near them as possible, and then making a rush at the herd, best pace. This had the effect of making them spring away with immense leaps, which were very beautiful to see; and when

closely pursued, a single leap will measure from fifteen to thirty feet. I have shot them from the saddle. No dog can attempt to approach the old ones; but a good Kaffir greyhound will sometimes pull down a young one, after a hard chase. Both old and young are good venison, and make excellent soup.

Soon after my arrival amongst the Kaffirs, I received a warning from Mr. Brownlee, the Guika commissioner, to keep a sharp look-out, as an attempt might be made on my life; so, for some time this information gave me the pleasing excitement of looking well to my revolver and double-barreled gun before going to bed at night; and my interpreter and soldier-servant, who were not paid quite so well as I was, and did not see the fun of running the risk of having their throats cut, were also very particular not to be caught napping. However, with the exception of losing a rather valuable horse, which was stolen from my stable, within a few feet of where I was sleeping, I was always treated with great respect, and most hospitably received, fed and lodged, when visiting kraals in my district. The Kaffir is essentially hospitable. On a journey, any one may go to the kraal of a stranger, and will certainly receive the best of good treatment, both according to his rank and position. My first duty was organizing a police force, consisting of fifty or sixty Kaffirs, who received payment monthly. The chiefs, as I said before, were also paid, and received £8 a month as long as they behaved themselves—or, in other words, so long as they assisted me in carrying out the governor's policy and plans with regard to them and their people. I employed three men as messengers; one of them, Dacumbana, was the most perfect model of a man I ever saw. Poor fellow!—I had to give him seven years' transportation for cattle-lifting. I call it cattle-lifting, because the act is not considered immoral in the way that theft is; and I rather think that the word they use for it is very similar with the Highland term for the same deed. If you will permit me, I will read a short account

of a Kaffir messenger from Mr. Wood's new book, "*The Uncivilized Races of the World*," as it answers in every respect to the men who were in my service:

"These young fellows are marvellously swift of foot, speed reckoning as one of the chief characteristics of a distinguished soldier. They are possessed of enormous endurance. You may send a Kaffir for 60 to 70 miles with a letter, and he will prepare for the start as quietly as if he had only a journey of three or four miles to perform. First, he cuts a stick some three feet in length, splits the end, and fixes the letter in the cleft, so that he may carry the missive without damaging it. He then looks to his supply of snuff, and, should he happen to run short of that needful luxury, it will add wings to his feet if a little tobacco be presented to him, which he can make into snuff at his first halt. Taking an assagai or two with him, and perhaps a short stick with a knob at the end, called a 'kerry,' he will start off at a slinging mixture between a run and a trot, and will hold this pace almost without cessation. As to provision for the journey, he need not trouble himself about it, for he is sure to fall in with some hut, or perhaps a village, and is equally sure of obtaining both food and shelter. He steers his course almost as if by intuition, regardless of beaten tracks, and arrives at his destination with the same mysterious certainty that characterizes the migration of the swallow. It is not so easy to address a letter in Africa as in England; and it is equally difficult to give directions for finding any particular home or village. If a chief should be on a visit, and asks his host to return the call, he simply tells him to go so many days in such a direction, and then turn for half a day in another direction, and so on. However, the Kaffir is quite satisfied with such indications, and is sure to attain his point. When the messenger has delivered his letter, he will squat down on the ground, take snuff, or smoke—probably both—and wait patiently for the answer. As a matter of course, refreshments will be supplied to him; and when the answer is handed to him, he will return at the same pace. Europeans are always surprised when they first see a young Kaffir undertake the delivery of a letter at so great a distance, and still more at the wonderfully short time in which he will perform the journey. Nor are they less surprised when they find that he thinks himself very well paid with a shilling for his trouble. In point of fact, the journey is scarcely troublesome at all. He has everything his own way. There is plenty of snuff in his box,

tobacco wherewith to make more, the prospect of seeing a number of fellow-countrymen on the way and enjoying a conversation with them, the dignity of being a messenger from one white chief to another, and the certainty of obtaining a sum of money which will enable him to adorn himself with a splendid set of beads at the next dance. Barefoot though he be, he seldom complains of any hurt. From constant usage the soles of his feet are defended by a thickened skin as insensible as the sole of any boot, and combining equal toughness with perfect elasticity. He will walk with unconcern over sharp stones and thorns which would lame a European in the first step, and has the great advantage of possessing a pair of soles which never wear out, but actually become stronger by use. Mr. Baines, the African hunter, narrates a rather ludicrous instance of the insensibility of the Kaffir's foot. Passing by some Kaffir houses, he heard doleful outcries, and found that a young boy was undergoing a medical or surgical operation, whichever may be the proper name. The boy was suffering from some ailment, for which the medicine-man prescribed a thorough kneading with a hot substance. The plan by which the process was carried out was simple and ingenious. A Kaffir man held his foot over the fire until the sole became quite hot. The boy was then held firmly on the ground, while the man trampled on him with the heated foot, and kneaded him well with this curious improvement of medicine. When that foot was cold, he heated the other; and so proceeded till the operation was concluded. The heat of his sole was so great that the poor boy could scarcely endure the pain, and struggled hard to get free ; but the operator felt no inconvenience whatever from subjecting his foot to such an ordeal. The dreaded 'stick' of the orientals would lose its terrors to a Kaffir, who would endure the bastinado with comparative impunity. Among these people the foot assumes its proper form and dimensions. The toes are not pinched together by shoes or boots, and reduced to the helpless state so common in this country. The foot is like that of an ancient statue, wide and full across the toes, each of which has its separate function, just as have the fingers of the hand, and each of which is equally capable of performing that function. Therefore, the gait of a Kaffir is perfection itself. He has not had his foot lifted high behind and depressed in front by high-heeled boots, nor the play of the instep checked by leathern bands."

Till my arrival, the power of the chief, supported by his counsellors, had been paramount in his tribe. He had the

power of life and death, and frequently exercised it in an arbitrary and reckless manner. The counsellors are themselves chieftains in a small way, and command the different subdivisions of the tribe; they were also paid by government. It is a very imposing sight to see a case tried before the chief, surrounded by his counsellors. He always dispenses justice seated on the ground in the cattle-kraal. If the case is an important one, it is argued before him at great length, and with much declamation and gesture on the part of the orator. The Kaffirs are great lawyers, and their reasoning faculties are powerful and active. They credit nothing, except witchcraft, that they are not fairly reasoned into. In a case of no importance, the chief decides it at once; or if it is frivolous and uninteresting, the plaintiff may be seen stating his case with great fluency, and nobody listening to him. When the case has been well argued, one or two of the counsellors speak, and give their opinions on its merits; and when the chief sees how public opinion inclines, he delivers judgment accordingly. The principal crime that came before me was cattle-lifting. When a farmer could trace his lost cattle across the border into Kaffirland, he handed the spoor or foot-prints over to one of my police, who, with most wonderful skill, would follow it with the certainty of a blood-hound, perhaps for miles, over hill and dale, till he, in his turn, could hand it over to the head-man, or chief of some village to which he had traced it, who was then answerable for it. The theft in this way was nearly always brought home to the right place. At any rate, the village at which the spoor was lost had to pay a fine of three-times the number of cattle stolen, two-thirds going to the farmer who had been robbed, and the remaining third I sold on the part of the government. Colonel Gawler, of the 73rd regiment, who was the political agent for the neighbouring district, with Macomo, the old scoundrel I mentioned in connection with the witchcraft story, was very successful in coercing the tribes under his supervision. He introduced flogging into his system of jurisprudence with great effect, and very much

o the astonishment of the recipients. It was a long time before they could quite understand why Gawler always gave them two dozen if they were found guilty of looking at a sheep over a colonial farmer's fence. They consequently stood in very great awe of him. However, one of his petty chiefs called on him one day in his war-paint, which he knew to be against the rule. Gawler saw him, and cautioned him not to do so again; but in a few days, being anxious, I suppose, to assert his independence, he returned again in his war-paint, as beautiful as before. Unfortunately for him, Colonel Gawler happened to be white-washing his hut at the time, and thought it a capital opportunity to read him a good practical lesson on disobedience to orders, by having him at once white-washed from head to foot, much to the chief's horror and indignation; but it is hard to kick against the pricks, and Gawler kept him in the hot sun until the wash was perfectly dry, before he allowed him to take his departure. As the black race have an idea that the devil is white, I have no doubt that the reappearance of the chief, white as the devil, must have caused much alarm and consternation among his loving wives and faithful followers.

The frontier farmer is a rough, independent pioneer of civilization, accustomed to look after himself, and fond of taking the law into his own hands when dealing with his Kaffir neighbours. He seldom lost an opportunity of a little rifle-practice at him when he ventured too near his farm. The farmers are principally English and Dutch, and hold their farms under a kind of military tenure, being obliged to furnish so many shots, or armed men, according to the acreage of their holdings, who are liable to be called out for military duty by their field-cornet, who is generally a farmer like themselves, and has the military command of a certain district. The Dutch (or the Boers) are generally a sober and industrious body of peasantry, traditionally religious, tracing their descent from the Huguenots and Dutch, some of the best

men that ever lived. They look upon themselves as the chosen people of God, who has given them the heathen for an inheritance; and consequently, they have always been very exacting and cruel in their treatment of the black race. Many of them live a curious gipsy wandering life in waggons, where they always have a rifle ready to fire at a Kaffir as soon as they see him. They take great pleasure in relating their warlike deeds, and glory in the bloody scenes in which they have themselves been the actors. I remember hearing two farmers bewailing the death of a friend, one Robert Pringle, and saying he was a great loss, "he was such an awful lucky shot at Kaffirs, was poor Robert Pringle." These itinerant Boers are very good people to meet, if you have a good horse or watch to dispose of, as they are always ready to buy, and willing to pay four or five-times the value of either. In company with a large Bible, which serves as a registry-office for their family, they usually carry all their money, sometimes amounting to four or five thousand pounds, about with them in the waggon. Money is no great object to them, and they have few demands on their purse, which no doubt accounts for their great liberality. They are free from the chief anxieties that attend a large family in civilized countries, and have no fear lest their offspring should not be able to find a subsistence. As a proof of their liberality, I may mention that in the *Illustrated London News* of the 22nd of last month, there is a sketch of a new Dutch church at Cradock, South Africa, which has just been completed at the cost of £27,000, subscribed by the Dutch Boers resident at that place. As I said before, the country at this time was in a very disturbed state. A prophet named Umlagaza had made his appearance, and was deluding the Kaffirs with most monstrous prophecies, and giving most outrageous orders, which the mass of the common people—being, like all savages, very superstitious—implicitly believed. He told them that (Hinza) Gaika and other dead patriarchs of the Kaffir race had appeared to him, and commanded him to issue an injunction to the people to

slaughter and destroy all their cattle and live stock, promising them, when the destruction of their property was complete, a general revival from the dead of all their ancestors, who would rise and join them to drive the English into the sea. The unfortunate people in many parts of the country performed their part of the contract. I need not say that the prophet signally failed in fulfilling his.

No more extraordinary delusion ever seized upon an unfortunate nation: the whole country for miles and miles stank with the smell of dead cattle rotting in the sun. I was able to prevent the slaughtering to a great extent in the district under my supervision. But there was the most dreadful suffering and famine throughout the country. It did good in one way, however, for a great exodus took place from Kaffirland into the colony, where labour was much wanted, and thousands of Kaffirs for the first time in their lives had to work for their daily bread. It was most painful to see them reduced to nothing but living skeletons, dragging their dying wives, and carrying on their backs emaciated, half-dead children, with their little household effects, towards the colony, many of them dropping by the way, never to rise again. The Kaffir has a particular horror of touching a dead body, and the wretched skeletons were left where they fell, till removed by nature's scavengers, the vultures and wild beasts. I had the greatest difficulty in finding people to remove some dead bodies from the immediate neighbourhood of my camp.

The aim of those who encouraged this extraordinary prophet—who, I believe, was a creature of Kraili's, the paramount chief of the Amakosa—was evidently to deprive the people of their own means of subsistence, and thereby to force on a desperate war with the English; but when the time came, the people were so exhausted with want that they had neither pluck nor strength left to undertake a rising. I may mention that these prophets play an important part in the religious system of the Kaffir tribes.

Their chief offices are: communicating with the spirits of the departed and ascertaining their wishes, counteracting spells thrown by witchcraft, and rain-making. A prophet must be descended from a prophet, though he need not be a prophet's son. He has to pass through a very long and arduous preparation for the office, and during his novitiate performs all kinds of insane feats. If he succeeds in his first attempts at prophecy, he will rise to unbounded power amongst his tribe. But should he fail, he is contemned as one whom the spirits of the departed think to be unworthy of their confidence. I believe the wretched impostor Umlagaza was put to a cruel death, which I have no doubt he richly deserved.

After this dreadful famine and destruction of property, the Kaffirs in British Kaffraria were pretty nearly, as our American cousins would say, "played out." And the prophet having done so much to further Sir George Gray's policy, he was not the style of man to let such an opportunity go by without profiting by it to the utmost. His former method of conciliation was now changed, and I was directed to select sites for villages throughout my country, and to insist on the scattered population being brought together, so as to be more under control. This I found a most difficult order to carry out, for, though there was no difficulty in finding good locations for any number of villages, the nature of the people, and their occupations as a pastoral race, did not admit of their living together in large numbers; and it was only by dint of threats to burn their huts, that I could induce them to move into the new villages. They were also to be taxed; but as they had no money, I fancy the tax-gatherer had rather a hard time of it. But how this part of Sir George's scheme turned out I cannot say, for, the Indian mutiny having broken out at this time, I had to proceed with my battalion to India, leaving, with much regret, this remarkable and interesting people, amongst whom I had succeeded in establishing very friendly relations.

I was particularly sorry to say good-bye to my kind friend Anta, and I think he quite reciprocated my feelings towards him. He knew that I always exerted myself for the benefit of his people, and always took his part when I could do so consistently with my duty to the government. And having now no further personal experiences of Kaffir life to relate, I beg to conclude with thanking you for the kind attention with which you have listened to me this evening.

PAPER II.—ARTILLERY RETROSPECT OF THE LAST GREAT WAR.

BY LIEUT.-COL. T. B. STRANGE, DOMINION ARTILLERY.

(*Read before the Society, April 3rd*, 1872.)

"*Pends-toi, François; nous nous sommes battus et tu n'y étais pas,*" was the laconic letter of the royal soldier *Henri Quatre* to his comrade—the same soldier-king who gave the right royal response, when asked for a standard:

> "Where'er ye see my white plume shine,
> "Amid the ranks of war,
> "Then be your oriflamme to-day
> "The helmet of Navarre."

A great war—alas! I fear, by no means the last great war—has passed into history; and as I was not there to see, how can I venture on a retrospect without craving your indulgence?—which you may be more likely to give when I tell you that, to gratify no idle curiosity, but simply as a soldier to learn, I asked and obtained the sanction of H.R.H. the Duke of Cambridge to join either of the contending armies, but was given to understand that political reasons forbid me or any of my brother-officers availing ourselves of the permission, even at our own risk and cost.

Permission was subsequently granted to a few as newspaper correspondents; but no English artillery officer was present at the great drama of the Prussian siege of Paris. We were disappointed; but, not inclined to follow the advice of Henri to his friend, we did not hang ourselves. At the conclusion of peace I visited the remains of both armies and many of their battle-fields. I had some friends among the officers of the French artillery, acquaintances made in happier days at Châlons. I never saw them again; and in spite of the contempt heaped upon the unsuccessful by the unthinking, I cannot but feel, from what I saw and heard from their enemies, that they did their duty.

Without further apology, I will aim at my object, and try, like a good gunner, to hit it. My subject divides itself into—

1st—Salient artillery operations in the field, and the lessons we may draw from them;

2nd—The sieges and their lessons;

3rd—The artillery *personnel* and *matériel* of the contending armies;

4th—The general deductions we may draw.

SALIENT ARTILLERY OPERATIONS IN THE FIELD.

It is commonly supposed that the superiority of the Prussian artillery was the principal cause of the German success and, indeed, the Emperor Napoleon himself attributed his final disaster at Sédan to the preponderating influence of the German field-artillery; but it was not altogether so: the artillery was but the keystone of that arch of triumph under which the German Emperor marched to victory.

It is easier to blame the grooves of a gun than the heart of a great nation. The French people (for I hold people responsible for their government) preferred a standing army and a system of substitutes to a national force and universal service; therefore, they were utterly outnumbered; and their centralized system of dealing with war material, of which the English control is a copy, rendered it impossible for them to equip and mobilise their armies as quickly as the Germans, who habitually decentralize and delegate the responsibility of equipment to the commanders of their local *corps d'armée;* and lastly, they were out-generalled, because their *etát major* and system of military instruction were inferior to the Prussian. Notwithstanding the war-cry, "*à Berlin*," they found themselves on the defensive, extended over a long arc from Thionville and Metz to Strasbourg;

while the Germans operated on the shorter cord of that arc by the valley of the Säar and Wissenburg. The French advanced posts, too far from their supports, hugging the frontier, yet not feeling beyond it, knew not of the vast German concentration in the wooded country close to their front. It is very difficult to unravel the thread of artillery action from the tangled web of battle, because artillery plays a double part in the great game—1st, divisional or merely supporting and acting with the other arms; 2nd, concentrating and striking terrible and decisive blows as a separate arm. Moreover, the first accounts of battles reach us from the pens of journalists, generally men of great energy and ability; but tall talk is their *metier*, and they are obliged to supply public demand for blood and thunder at so much a line: even soldiers, themselves engaged, are the poorest narrators of the outline of an action, being so entirely engrossed with what passes in their immediate front. Waterloo veterans still wrangle as to whether the final repulse of the last French column was due to the advance of the 52nd or the Guards. Comparing small things with great, I have been unable to recognize the official accounts of actions in which I had the honor to be engaged.

The first great battle of the last great war was at Wissenburg. We cannot linger over the historic reminiscences of the old fortress that once rolled back the tide of war under Marlborough.

In the same locality, the Crown Prince of Prussia, with more than forty thousand men, surprised and destroyed the corps of General Douay, only 8,000 strong. While the French were cooking their morning soup, the mass of Prussian guns having gained the heights of Schweigen, suddenly opened a heavy fire on the enemy's camp and the village of Wissenburg. With the old impetuosity of their race, the French sprang to arms, but were ordered by General Douay to remain as much as possible behind Wissenburg. The precaution was useless: the Prussian guns, from their commanding position,

rained death upon them, whether they advanced or sought shelter. The French artillery, consisting only of three light field-batteries and one of mitrailleurs, was soon overwhelmed; and, according to the German official account, "the mitrailleurs fired only a few rounds, and were easily silenced by the Prussian guns." The overwhelming numbers of the Crown Prince outflanked and took the hill of Geisburg; the outnumbered French, still pursued by the deadly Prussian shells, and harrassed by the Black Brunswick Hussars, turned retreat to rout. Wissenburg was quickly followed by Wœrth. The French position was salient, almost semicircular; thus offering to the Prussians the opportunity ever coveted by artillerists, viz., the chance of enfilading both wings from a point nearly opposite the centre The Prussian guns were thus massed on the heights south of Gorsdorf and north-west of Gunstadt, and, as usual, they were felt before they were seen. Those on the Gorsdorf heights commenced the action by enfilading the whole French left, and compelling Marshal MacMahon to change the front of the first division: the manœuvre was brilliantly executed by the French. Later in the day, fourteen German batteries (84 guns) near Gunstadt, were launched upon the French right wing, enfilading it in the line of its greatest depth; and not only the fourth division, but also the unfortunate second, which stood behind them, and had already borne the brunt of battle at Wissenburg. A battery of the 5th corps, north of Spachbach, occupied the French guns; these latter are said to have been well served but poorly handled, for the gallant French artillery seem to have forgotten the tactical lessons of their great artillery chief, Napoleon I.; they, however, nobly sacrificed themselves at the close of the action in endeavoring to save their broken infantry. At this battle, also, the French were greatly outnumbered, and failed to receive assistance from De Failly's corps. MacMahon's position was strategically good, as fairly covering the two important railway communications with Strasbourg through Hagenau, and with Metz *viâ* Bitsche. On the same day that the Crown Prince thus severed the French

army and cut off its right wing, some forty miles distant, in a north-westerly direction from the field of Wœrth, the first Prussian army, under Steinmetz, assisted by part of the second, also cut the French line at Spichern, thus hopelessly dividing MacMahon and Bazaine. The ridge of Spichern overlooks the village of Säarbruck, the scene of the *baptême de feu* of the Prince Imperial. As usual, the French were surprised by the opening of the Prussian artillery, six batteries, from a hill overlooking the valley from which a part of Frossard's force had not been withdrawn. The leading artillery features of the battle are, the rapid bringing-up and concentration of guns, in some instances galloping along the roads to the front, while the infantry of their divisions were partially sent on by rail. This mobility of field-artillery is possible only to the Prussians—not to the French, from a defective system on which I shall touch. It is said that the Prussian guns, after advancing over the plain, produced little impression, firing up-hill on the French infantry extended on the ridge, from the fact that shells fired with percussion fuzes either buried themselves in the face of the abrupt slope or flew harmless over the heads of the defenders.

The French guns massed on the left to oppose the flanking movement on Stering, dislodged the mass of Prussian cavalry who were sent under cover to the other flank: this should have been a great gain, because the road to Forbach was the strategic line of French retreat and support. But the crowning artillery achievement was the daring advance of two batteries of German guns up a steep mountain-track, on to the summit of a ridge on the French right, where they enfiladed the whole line. I was informed, through a Prussian general, that the French line, who had resisted so gallantly, were first shaken by this fire, which drove them from their entrenchment, and rendered possible the final advance of the German infantry, whose previous losses, while supported only by direct artillery-fire, had been terrible; also, at this critical juncture a mass of German guns advanced, and, firing across

the road and rail, enfiladed the French left, and threatened to cut off the line of retreat. In the earlier part of this battle the French had the superiority in numbers and position; but they were left by their generals with a most inadequate supply of artillery—one of those unaccountable mistakes which marked French generalship. While Frossard's force fought splendidly all day, seven divisions of Bazaine's stood inactive ten miles from the valley of the Säar. The Germans, having turned the French left by Forbach, the 2nd division, sent by Bazaine, could not cover the retreat of Frossard's utterly disorganized force, which retreated to the south-west, leaving open the road to St. Avold and Metz. Then the German armies, with a cloud of cavalry in their front, gradually brought up their left flank. The small fortresses of Phalsburg and Bitsche, especially the latter, whose guns commanded the line of rail to the west, compelled them to make a considerable *détour*, and leave behind a masking force. They held out for a long time, and shew the advantage of even a small fort on a strategic line of road or rail. The French commanders proposed to abandon the line of the Moselle, leaving a garrison in Metz with orders to defend or die,—the scattered divisions, concentrating at Châlons (the only safe point for concentration) there to fight on their well-known exercising ground, where, history tells us, the fate of France had before been decided in her favor. With Paris as a base, and reinforcements to swell the army, the result of the war might have been different; but politicians stepped in, and decreed her ruin. Bazaine, appointed to the chief command, remained at Metz (where the Emperor also lingered), hoping to fall upon the divided German armies crossing to the north and south of Metz; but their whole force passed to the south at Ars and Pont à Mousson, while Steinmetz had occupied the attention of the French by the battle of Courcelles. This was an obstinate soldiers' battle, without any particular display of tactical skill. Bazaine committed an error in fighting at all: having previously determined to retreat towards Verdun, he

should have done so, and left the protection of his rear to the fortress, instead of fighting a battle with his army astride of the Moselle, and an enemy whose object it was to detain him. The French engineers had unaccountably neglected to blow up the bridges over the Moselle, to the south, though they destroyed some in their own line of retreat. Bazaine's first march was a very short one, and impeded by an enormous quantity of baggage: he gives a further reason for delay in the fact that the French intendence, or control department, had stowed away six million of cartridges without telling him where to find them, and, moreover, had themselves forgotten their whereabouts. This gave the Germans time; they pushed forward as far as Mars-le-Tour with cavalry and guns, and struck the head of the French advance, also cavalry, apparently without guns. The French prepared to charge; but the German cavalry, who masked their guns, wheeling right and left, opened out and left the guns to work their deadly destiny, and thus turn the tide of French retreat.

At Vionville and Rézonville, in a somewhat similar manner, the French columns were fiercely struck, and held by cavalry and artillery until the infantry came up. The success of the final infantry onslaught is attributed by Captain Hozier to the Prussian artillery being, as usual, massed on their enemies' flank. The extraordinary mobility of the Prussian field-artillery, principally due to their system of carrying sufficient men on limbers and gun axle-seats, rendered possible their style of vigorous artillery action, impossible to the French with their antiquated system of carrying gunners on the waggons, or leaving them behind out of breath.

The Prussian cavalry sacrificed themselves with the same heroic gallantry as the English at Balaclava, with the difference that their self-sacrifice had a strategic object and result, viz., holding the French for their comrades to come up. One terrible charge was made through two French

batteries with bodies of infantry in their rear, to be finally met by the hostile cavalry. A little more than a fourth of the horsemen responded to the regimental call at that night's bivouac.

The French fought with the determined fury of their race, and inflicted terrible losses on their enemies, considering that they had gained a victory; but as corps after corps came into position on the left, and wheeled up, the German army, which at first looked northward, finished the fight with its front to the Rhine; while Bazaine had been compelled to fight with his face towards Châlons, and Paris his line of retreat, just a fortnight from the opening affair at Säarbruck. After these bloody struggles at Mars-la-Tours, Vionville, and Rézonville, Bazaine took up a position at Gravelotte. He had been nearly taken prisoner by the rapid German advance, whose guns had actually opened fire on the rear of the Emperor's escort as he left the army with his son. The tactical advantages of Gravelotte as a defensive position shewed skill in the selection of ground, for which Marshal Bazaine is famous. It is a long ridge, the top of which forms an open natural glacis; the crest was strongly intrenched, and his artillery there posted; the left rests on densely-wooded ravines, running down to the Moselle; and one of these, parallel to the face of the position, is difficult to cross except by the road running at right angles to the French front, which was swept with guns and the fire of a fortified farm-house. The Prussians lost terribly in repeated attempts to attack by this road. The difficulties of assault on the left of the position rendered it almost entirely an artillery action, where 84 Prussian guns were deployed by a most spirited manœuvre. They galloped up a lane through one of these ravines, which concealed them till they reached the *plateau* south of Gravelotte. The guns were crowded, to avoid drawing fire by extending in front of the village, which was used as a field-hospital; and the loss of the Prussian artillery here is evident from the mounds of earth that mark their resting-place—" man and horse in one

red burial blent." The three leading batteries were met by the fire of four *mitrailleurs;* but, concentrating their whole fire on the nearest, there remained nothing but wreck after a single round. The second and third were treated to a similar dose of concentration, and the fourth retired precipitately to avoid annihilation.

This concentration of fire, to be produced in the heat of battle, must be inculcated and practiced in peace. The whole 84, thus concentrated on the French guns, silenced them in succession. This sort of advance of the right men, at the right time, to the right place, was, in a great measure, due to the excellent maps served out to artillery-commanders by the Prussian War-office. I was favored with the loan of one of these that belonged to a Prussian captain of artillery: it was a photograph-copy of the map of the French survey. They were turned out in Prussia by thousands long before the war; and, though it folded up so as to fit the pocket, it was so clear that by its aid any average artillery-commander could act with trenchant certainty. Among the sayings of soldiers worth remembering is that of Marshal Saxe, that "the first requirements of an army were legs, the 2nd legs, and the 3rd legs." It is equivalent to that of Wellington, who reiterated "boots;" with us it might possibly be "snow-shoes." Prussian officers reiterate "maps"—accurate maps distributed to squadron-leaders and battery-commanders. The infantry, working in larger units, do not require so many, except on outposts. The French resisted every assault, until, as usual, outflanked by the Prussians—the Guards and Saxons—whose artillery, occupying the hill of St. Privat, at right angles to the French position, enfiladed it, and rendered possible the steady advance of the infantry. It is worthy of note that the isolated attempts of German artillery to advance in the open to close range, 600 yards, against infantry in shelter trenches, resulted in artillery destruction. On one of these occasions, a single gun, one officer, and three gunners alone remained; and when ordered to retire, the young subaltern's reply, from the midst of his dying comrades, was:

"Tell General Steinmetz that where guns have advanced, there also can infantry: let him send supports to me; I will not retire to them; rather will I die on my gun-carriage, and rest here with my comrades." He was as good as his word: he did not retire from his position until he had expended his last shot, and brought his gun, which he had worked with the assisiance of his three gunners, safely out of action, for the infantry did not come forward here until much later.

The final catastrophe of Sédan was the greatest triumph of the German artillery. When that fatal morning dawned, the unfortunate French saw, from every gentle hill of the amphitheatre that surrounded them, the white puffs that shewed the trial-shots of German guns. Their concentrated fire was unendurable, and enfiladed each face of the old fortress situated in a basin; and thus a fortress and army fell before the field-guns of an army wielded with strategic skill. Of course, we must not forget that it was political interference that dictated a movement on a line that ended in a fight with a neutral instead of a friendly territory in the rear.

Not much artillery incident of value is to be gained by following the struggles of the brave but ignorant and undisciplined levies, *en masse*, who, organized by eloquent *avocâts*, tried in vain to oppose the national army of a people who for half a century had patiently practised the art of war in peace, and were not too effeminate to ignore the duty of personal service, without exception, for peasant, peer or prince.

Now for the artillery lessons we have to learn. The efficiency of artillery must be considered as *Scientific*, *Technical*, and *Tactical*.

SCIENTIFIC.

Comparing the French and German artillery officers under the first head, I am inclined to think the French artillery officer, being a competitive *élève* of the *école Polytechnique*, was more highly trained to pure mathematics than the German, to the exclusion of more practical artillery knowledge; for an instance is recorded of an artillery-officer of the French Imperial Guard expressing himself ignoran

the fact that rifling produced derivation or constant flexion on the projectile of his piece. This neglect practical artillery is further shewn in the fact that the ench artillery drill-books contain no gunnery rules, while e Germans are carefully instructed. We may infer, erefore, that there may be high scientific training in pure athematics without corresponding practical training; indeed e means is often substituted for the end. Mathematics may looked at as a species of mental gymnastics; yet some ofessors would lead us to suppose they are the end and n of life, civil and military.

TECHNICAL.

From a technical artillery point of view, we must consider th the gun and the gunner.

'he much-abused rifle-gun of France, it must be remembered, the oldest in Europe. The march of the artillery of the first apoleon was muffled from Austrian ears by hay-bands round e wheels. The astute nephew introduced rifle guns, and after ssing them over the Alps in packing cases, marked "glass th care," startled Europe and shattered the Austrian reserves Magenta and Solferino. There was some excuse for reposing laurels thus gained; and we must not forget that the last itish muzzle-loading rifle field-gun, the hardest-hitting, thest-ranging, most accurate gun in the world, is but a odification of the French system applied to steel and wrought n instead of bronze. The magnitude of misfortune must not d us to ignore the military sagacity of Napoleon III. and the ench artillery in the earlier days of the empire. It only ews that laurels are not to be rested upon; and there is, alas! truce to preparation for the great game of war.

It was principally a matter of economy that compelled the icers of the French artillery to rest content with their old ns (in very many instances smooth bores rifled up), without er being recast.

And when re-cast, our experience at Woolwich would tend show that the older bronze is better than the new. Like

many ancient arts, it has fallen into inefficiency from disuse. The metal was soft, and was said to wear so quickly as to produce inaccuracy; using up some of the old guns possibly necessitated a larger calibre than the length of projectile admitted. We see from the following table, taking the ordinary field-gun of both countries, that the

French 4-pounder—calibre, 3.41"—gives an area of 9 square inches, nearly, resistance to air; initial velocity, 1066 feet per second.

Prussian 4-pounder—calibre, 3.089"—gives an area of 7 square inches, nearly, resistance to air; initial velocity, 1184 feet per second.

Therefore, the French shell, which offers more resistance to the air, starts with less velocity than the Prussian, and a higher trajectory, which means less accuracy or margin of error, less range, less striking power.

It must be borne in mind, in considering the following table, that the nomenclature of rifled field-guns in England differs from that of other countries. We speak of the gun by the actual weight of the elongated projectile it throws, while foreign artillerists designate the rifled piece by the weight of spherical projectile fitting the bore. Comparing the calibre and weight of projectiles, it will be seen that the Prussian and French 4-pounder correspond with the English 9-pounder, though the weight of the English gun is 8 cwt. against 5½ cwt. of the Prussian gun and 6½ cwt. of the French. This would, at first sight, seem a disadvantage; but English horses are more powerful than continental horses, and two or three cwt. on wheels, divided between six horses, is not a matter of much moment. The disadvantage is more than compensated for by the increased charge and power of the English gun: indeed, many British artillerists regret that the projectile was not elongated so as to weigh 12 lbs., which would give a much more effective capacity of shell; and though the initial velocity would be less, yet the terminal velocity would be greater at 2000 yards and upwards, even if fired with the same charge,—because the 9 and 12-pounder shells exposing only the same sectional area of resistance to air, the latter has greater weight to overcome that resistance. The Prussian gun which throws a 15-lb. shell, and only weighs 8½ cwt., was found an effective and mobile gun; the French 12-cwt.-gun, throwing a 25-lb. projectile, being cumbersome in the field.

I fear the English Field Artillery will be too heavily handicapped with their new 16-pounder of 13-cwt., which is a powerful gun; but the weight of shell being great, very few rounds can be carried into action.

The Prussians, during the war, confined themselves to the use of common shell. The practice of the quack, who uses only one kind of pill for the destruction of men, is admitted by the Prussians themselves to be

inapplicable to the varying circumstances of war, which demand the occasional use of shrapnel as well as common shell. With the introduction of the former, for which a time-fuze is most suitable, the Prussians must follow the English through the difficulties they have overcome.

Table of Comparative Ranges of British and Foreign Field Guns.

Nation.	Nature of Gun.	Calibre.	Charge.		Nominal weight of common shell, filled.		Initial velocity.	Ranges, in yards.											
								1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°	12°
		inches	lbs.	ozs.	lbs	ozs.	feet.												
BRITISH.....	16-pr. M. L. of 12 cwt...	3·6	3	0	16	0	1355	725	1150	1560	1920	224[illegible]	2560	2840	3120	3400	3660	3920	4150
	12-pr. B. L of 8 cwt.....	3·0	1	8	12	0	1170	580	1000	1395	17[illegible]0	2045	2340	2600	2846	3065	3280	3480	3680
	9-pr. M. L. of 8 cwt.....	3·0	1	12	9	0	1380	660	1125	1490	1810	2095	2350	2605	2830	3040	3235	3420	3606
PRUSSIAN....	6-pr. B L of 6.3 cwt...	3·604	1	4·8	15	3	1067	410	779	1107	1410	1673	1935	2197	2446	2678	2896	3104	3304
	4-pr. B. L. of 5·5 cwt....	3·089	1	1·6	9	6	1210	492	940	1290	1634	1927	2198	2460	2690	2924	3144	3362	3567
FRENCH.....	12-pr. M. L. of 12 cwt...	4·776	2	3	25	6·4	1006	443	820	1115	1403	1640	1845	2047	2237	2405	2570	2720	2860
	4-pr. M. L. of 6·5 cwt..	3 406	1	3	9	0	1006	415	765	1047	1305	1531	1725	1910	2080	2245	2406	2545	2685
BELGIAN	6-pr. B. L. of 8· 5 cwt....	3·622	1	5·6	15	0	—	475	875	1246	1585	1914	2215	2488	2756	2996	3215	3434	3653
	4-pr. B. L. of 5·7 cwt...	3 071	1	2·7	9	3·2	1520	602	1022	1381	1723	2024	2326	2570	2822	3040	3259	3478	3675
AUSTRIAN....	8-pr M. L. of 9·8 cwt....	3 83	2	0·75	14	8	1105	510	830	1130	1410	1675	1920	2150	2365	2565	2750	2920	3075
	4-pr. M. L. of 5·2 cwt...	3·08	1	2·5	8	0	1054	535	835	1120	1365	1585	1785	1990	2180	2355	2520	2670	2815
RUSSIAN.....	9-pr B. L. of 12·3 cwt..	4·2	2	11.3	24	6	1050	470	835	1185	1505	1810	2095	2370	2630	2880	3120	3345	3560
	4-pr. B. L. of 6 3 cwt....	3·42	1	5·6	12	10	1004	410	755	1075	1370	1645	1930	2170	2410	2635	2845	3045	3230
AMERICAN ...	20-pr. M. L. Parrott of 15·7 cwt.....	3·67	2	0	19	8	—	420	840	1260	1680	2100	2350	2600	2850	310[illegible]	3350	3565	3780
	10-pr. M. L. Parrott of 8 cwt....	2·9	1	0	10	0	—	400	800	1180	1550	2000	2250	2600	2800	3000	3200	3400	3600
	3-inch M. L. ordnance of 7·3 cwt.....	3·0	1	0	11	0	—	645	1010	1310	1525	1835	2100	2325	2400	2790	2910	3110	3270

The Prussians used only a percussion fuze requiring no adjustment. The French time-fuzes were almost invariably short-set, and the projectile comparatively harmless.

But I am of opinion the main difference lay in the man and his training. Was the French gunner educated up to his weapon? The Prussian system of universal service forces into the ranks of their artillery a very large proportion of highly-educated, intelligent men. It was an easy task to select those who combined intelligence with natural quick sight and steadiness of nerve, and entrust the pointing of guns to these men only.

The French army, like the English, being recruited mainly from the poorer and less-educated classes, it is more difficult to get this selection of marksmen. In the British service it has not yet been attempted, and thousands of pounds sterling are fired away by men who may be short-sighted or too illiterate to read the figures on a tangent scale or time-fuze. In the French service there was an effort to remedy this by selecting *pointeurs;* but the character of the modern French seems to place them at a disadvantage in the use of arms of precision, and the old *Fureur-Française* of historic chivairly has a tendency to waste ammunition.

If I may venture to form an opinion, and be permitted to express it, it appears to me that the French *habitan*, whether it be that he is more directly descended from the old Norse Norman type, or that two centuries of residence under the rigours of a climate as severe as that of Scandinavia, the original cradle of his race, have cooled down his excitability and given him the character as well as something of the *physique* of the Teuton,—whatever be the cause, I believe he makes an excellent gunner; and I cannot but have confidence in the military future of a force in which are happily blended the descendants of those who fought under Wolfe and Montcalm. Past fields of victory, gained by combined French and English Canadians on this continent, point to the same conclusion.

TACTICAL.

The first Artillery tactical consideration is mobility, without which there can be no application of tactics in the field.

The French had no practical mobility, for they had no means of carrying the gunners (except for the few horse-artillery of the guard). Their light guns well horsed could move with facility; but the men were carried on ammunition waggons which had to be left far in the rear out of fire. A gun without a gunner is a body without a soul.

Until the present year, the English and French were the only two powers who retained this antiquated system. The Prussians carry sufficient gunners to work the gun on axle-seats and limber-boxes. Even if it were agreeable to a mixed audience, time will not permit me to go into details of artillery tactical lessons; suffice it to say, generally, that the last is the only war in which both sides have been completely armed with breech-loading small arms and rifled cannon. Previous struggles show us chiefly what to avoid; and though general principles remain unaltered, their application must not be fettered by the old stereotyped idea that artillery must conform to its infantry—for, as a rule, the limit of infantry-fire is the commencement of modern artillery efficacy.

Its double action, as divisional or supporting, and reserve or striking, in obedience to a master-mind, must never be lost sight of. Artillery-action, therefore, more than ever requires an artillery head. The dictum of the first Napoleon, that "the general engagement once begun, he who has the address to bring, suddenly and unknown to the enemy, an unexpected amount of artillery to bear upon the most important points, is sure to carry them," remains unchanged, but is to be acted upon, not in a spirit of servile imitation, by an agglomeration of guns at close range, but, when practicable, by a dispersion of batteries and concentration of fire.

Everything points to the fact that field-artillery is not a force to be extemporized on emergency; and Prussian

experience of artillery failure in 1866 (for there has been Prussian failure as well as French failure) shews, in the words of Captain Hozier, "that a large infusion of raw elements into Field-Artillery, to strengthen it suddenly, defeated its object by crippling the efficiency of batteries." This paper may appear meagre: the subject has already been over-written; but I have sifted my facts on the very ground of the theatre of war, among the very actors themselves; and I have not neglected to avail myself of pamphlets and books—amongst others, that of Captain Hozier, formerly of the Royal Artillery, and a work full of interest that lately came into my hands in this city—"The Franco-German War," by Elihu Rich. The subject of modern sieges is too large to be included in this paper, which must already have taxed your patience. I think the last and most important lesson we have to lay to heart, as citizens and soldiers, is, that neither science, strategy, technical or tactical skill, can avail anything to the armies of a people who subordinate these things to the necessities of political faction.

'APER III.—CANADIAN HISTORY: THE SIEGE AND BLOCKADE OF QUEBEC, BY GENERALS MONTGOMERY AND ARNOLD, IN 1775-6.

By Dr. WM. JAS. ANDERSON, President.

(*Read before the Society, March 6th, 1872.*)

On the 6th July, 1775, the American *Congress* published ne *Declaration* of Independence, and at once commenced ctive military operations in the neighbourhood of Boston; nd though they met a serious reverse on their first collision vith the British troops at *Bunker's Hill*, their adversaries eaped no advantage; and the *Continentals*, as they were alled, still invested Boston, increasing in numbers every ay. As the British commander did not think it prudent o make any further attack until the arrival of reinforcements, ne Congress decided to carry the war into Canada and to y to take Quebec. The feeling of repulsion which had ver existed between the Canadinas and the "*Bostonnais*" vas by no means diminished; but Congress was well nformed that there was no very loyal feeling between the Canadians and their new masters, and that a portion of them, specially in Montreal and Quebec, were positively isaffected. The feeling of disloyalty they also knew was not onfined to the French Canadians, as some of the most actively iscontented were of British or Irish origin, and were already n correspondence with them. They likewise knew that the British authorities in Canada had only one weak battalion, onsisting of a part of the 7th Fusiliers and 26th regiment, or the defence of the whole Province. Taking advantage of he position, Congress decided on sending, with secrecy and elerity, two corps, under able and energetic commanders, ne first of which, under General Montgomery, was to make descent on Montreal by Lake Champlain; the other, ommanded by Arnold, was to move up the Kennebec river nd down the Chaudière upon Quebec. This latter attempt

could only have been thought of and undertaken, particularly at so advanced a period of the year, by men who had been inured to the hardships and toils of the early settlers of America, and were animated by the self-reliance and enthusiasm which such a life is calculated to produce.

Three thousand men, who had assembled at *Crown Point* under Montgomery, suddenly advanced into Canada. *Isle aux Noix* was evacuated at their approach, and, meeting no obstruction, Forts St. John and Chambly were at once invested. 500 British regulars, with 200 Canadian militia, defended St. John; the detachment which occupied Chambly, which was totally indefensible, surrendered on being summoned. A large quantity of stores and ammunition, which had been very unaccountably placed there, fell into Montgomery's hands. Sir Guy Carleton, the Governor, was then at Sorel with a battalion of militia and some Highland settlers whom he had hastily collected; with another corps of militia he proposed to move on St. John and raise the siege; but the Americans having already occupied the St. Lawrence, he was unable to pass over from Montreal to La Prairie, which was occupied by the enemy. On this the troops at Sorel *dispersed;* and St. John, a simple earthenwork without any casemates, having no prospect of relief, capitulated on the 3rd November. Montgomery immediately advanced on Sorel, sent a detachment across the St. Lawrence, and established batteries on either side, which completely commanded the navigation and prevented all communication between Quebec and Montreal. Montreal, without a garrison, and with a partially disaffected population, capitulated on the 13th November, and with it surrendered eleven British vessels. The arrangements of Sir Guy Carleton to this date have been severely criticised and condemned by some parties; but perhaps Sir James Carmichael is only just when he says: "The American attack was, however, so unexpected, and so immediately followed the commencement of hostilities, that in all probability no arrangement for the defence of the Canadian frontier had been contemplated."

While there can be no doubt that, as a body, the *Canadians* were at this time indifferent, if not disaffected, it would be unjust not to mention the two hundred who were shut up in St. John, and who behaved very creditably during the siege; but special notice is due to *M. Louis M. de Salaberry*, who was seriously wounded by the explosion of a shell thrown into the fort by the *Americans*. We ought also to record the only success which had hitherto attended the British. On sitting down before St John, Montgomery had despatched the celebrated *Ethan Allan* with a reconnoitering party. Allan, arriving in the neighbourhood of Montreal, learned that the town was weakly defended, and that if he made the attempt to take it by surprise he would likely be successful, as he would be aided by the disaffected. Though his command did not exceed two hundred men, a great portion of whom, according to *Lossing*, the American writer, were Canadians whom he had enlisted, he boldly determined to make the attempt in conjunction with Major Brown, whom he accidentally met on a similar errand, and at the head of a mixed force like his own. *He* was to cross at Longueuil, *Brown* at La Prairie; and the attack was to be made simultaneously from these opposite points at dawn of day. Allan succeeded in crossing in canoes; Brown did not make his appearance. In the meantime, information of the proposed attempt had reached Sir Guy Carleton through a deserter; he promptly collected two hundred and fifty of the inhabitants, chiefly English and Irish, and sent them with thirty men of the 26th regiment, under Major Carsden, to attack the invaders. In the meantime, Allan, not having been joined by Brown, and being informed of the then state of things in Montreal, had retreated to some houses, where he was attacked next day by the British, and after a short resistance compelled to surrender. All the Canadians had deserted him; five of his men were killed and ten wounded; and the remaining thirty-eight, with himself, became prisoners of war. On the British side, Major Carsden, the commander, Mr. Patterson, a merchant, and two privates were killed.

Before the American army entered Montreal, Carleton destroyed the public stores, and, together with Brigadier Prescott and one hundred and twenty soldiers, left it, with the intention of reaching Quebec, which *he* fortunately succeeded in doing, having, by the aid of a loyal Canadian, *Captain Bouchette*, grandfather of the present Surveyor-General, passed through the American floating batteries, &c., at Sorel, in a boat with muffled oars, during the night.* Prescott and the soldiers were not so successful, but next day had to surrender themselves prisoners of war. Sir Guy Carleton did not reach Quebec a moment too soon. We have mentioned how the force collected at Sorel had dissolved. Fortunately, Colonel McLean, who commanded the *Royal Emigrants*, chiefly composed of the disbanded Fraser's Highlanders, retreated with them in a body numbering one hundred and fifty, to Quebec; these, with about one hundred recruits which had been raised by Malcolm Fraser and Captain Campbell in Newfoundland, and which had just landed, seventy Royal Fusiliers, and twenty-two Royal Artillery, formed the nucleus of a garrison.

In the meantime, Arnold, whose force consisted of 1,200 men, embarked on the Kennebec on the 22nd September in 200 batteaux; after encountering incredible and unexpected hardships, he arrived with his force greatly diminished by desertions at Point Levis, on the 9th of November. Their approach, however, was not then unexpected, as an Indian, to whom Arnold had entrusted despatches for Montgomery, had delivered them to Lieutenant-Governor Cramahé. Fortunately, too, at this time the *Lizard* frigate arrived from England with £20,000. Though Cramahé, if we credit

* The Quebec *Gazette* of 23rd November contains this notice:—"On Sunday last, at noon, the armed snow *Fell*, Captain Napier, arrived from above, having on board His Excellency Major-General *Carleton*, Charles *Lenaudière*, Esq., his A.D.C., Captain Owen and Captain Selwyn, of the 7th or Royal Fusiliers, with several men of their corps. His Excellency was saluted on his arrival by the garrison and the frigates and armed vessels in harbour."

Major Henry Caldwell, was not the right man in the right place, but was thought to truckle to the disaffected, a council of war was held, at which it was decided that the town should be defended to the last. The most prominent men in this council were the captains of the *Lizard* and *Hunter* and Colonel McLean and Major Galdwell. A very important decision was arrived at, that the *Lizard* and *Hunter* should winter in Quebec, and their crews assist in the defence of the place, and that an embargo should be laid on all the merchantmen in harbour, so that their masters and crews might also be made available.

Arnold arrived at Point Levis on the 9th; but as all the boats and canoes had been removed, a surprise was out of the question. And as it took several days to collect the necessary means of transport, and as the river was commanded by the ships of war, he only succeeded in crossing during the night of the 13th, when, landing at Wolfe's cove, he made his appearance on the morrow on the heights of Abraham, his whole force not exceeding 800 men. They at once took possession of the General Hospital and Major Caldwell's house at *Sans-Bruit*, on the St. Foy road. The troops were hutted on the plains; but Arnold, fearing an attack from the town, as his troops were in want of ammunition and stores of all kinds, after laying the neighbourhood under contribution for horses, bullocks, beef, &c., at the end of the week retreated to Pointe-aux-Trembles, there to await a junction with Montgomery. The day after the withdrawal of Arnold, Carleton arrived at Quebec, and at once inspired new life and vigor into the administration of affairs. Unfortunately, there had been during the last six months a misunderstanding between Sir Guy and Major Caldwell; but the latter, immediately on the General's arrival, called on him, and henceforth worked cordially with him for the public good. The General's first step was to order all *the suspected, and all who were unwilling to take up arms, to leave the town.* "That order," says Caldwell, "strengthened the garrison considerably. We could guard

against open and avowed enemies, but not against those lurking about town; cabals then ceased, and everybody seemed zealous for the public service: the *Bonfields* left the town on that occasion; *Wells, Zachary McAuley, Murdock Stewart, John McCord*, and several others, among whom were four or five of the militia officers appointed by Cramahé. It is not doubted whether your friend, Mr. Allsop, would have been of the number, had it not been for the employments he held. He continued, however, to be almost the only man in the garrison that did not do duty, pleading his business as commissary, to which employment Mr. Carleton named him." We can judge from this of the anxiety and doubt which must have existed as to the good faith of many within the city. All the English authorities agree that the *Canadians* were *all* at first very lukewarm; but, finding the English inhabitants resolved to defend the town, a body of them ultimately came round, and some distinguished themselves by their zeal, hearty co-operation, and approved bravery; still, it is shown that though the numbers of the *Canadians* capable of bearing arms largely exceeded the British, yet, out of 1,800 men organized for the defence, there were only five hundred and fifty-three Canadians under that excellent officer, Colonel Dupré; the rest, in addition to the regulars already mentioned, were composed of 330 British militia, commanded by Caldwell; 400 seamen, under Captains Hamilton and McKenzie; 50 masters and mates, 35 marines, and 120 artificers.

Talking of the British, Caldwell says:—" We were about 330, officers included; everybody did duty, either as officers or privates, and, I can assure you, duty was never done with more punctuality or earnestness—inhabitants worth £3,000 or £4,000 standing sentry in their turn, during our severe winter nights, with the greatest alacrity; and what is still more to their honor, (as it was found necessary to mix the guards, British and Canadian,) they submitted with the greatest cheerfulness to the command of the Canadian officers, whom they held cheap, and who were in reality their

nferiors, both as to education and fortune. Indeed, I had he greatest reason in general to be satisfied with my corps ; or Cramahé gave up his share of the command of it, never naking his appearance out of doors the whole winter."

On the 1st December Montgomery joined Arnold at *Pointe-aux-Trembles*, and their united forces little exceeded 000 men ; but they had the confidence of men who had lready achieved great deeds, and had hope that their friends vithin and in the neighbourhood of Quebec, with whom they nanaged to keep up a regular correspondence, would be ble to aid them in many ways. Accordingly they advanced, nd on the 4th arrived before Quebec, and at once established hemselves in its neighbourhood, occupying many houses n the suburbs, chiefly in St. Roch's. General Montgomery stablished his head-quarters at *Holland's House*, which tood in the neighbourhood of the present Holland House, rom whence he sent a flag to summon the city to surrender. General Carleton refused to hold any communication ; and Montgomery, highly indignant, proceeded to erect batteries, vhich, from the small calibre of the guns, proved utterly nefficient.

In the meantime the besieged were not idle. The defences f the city were far from perfect, and there was no officer of ngineers there but the subsequently well-known *James Thompson*, who had come out to Canada with Wolfe as a olunteer in the Fraser's Highlanders, and who, in onsideration of his services at Louisbourg and Quebec, had een appointed, in 1761, Superintendent of Military Works t Quebec by General Murray. Mr. Thompson, in his ournal, informs us :—"I received the orders of General Carleton to put the extensive fortifications of Quebec in a tate of defence at a time when there was not a single rticle of material in store with which to perform such an ndertaking. I was, consequently, authorized to purchase ll that was needful, and to prosecute the work with the reatest despatch. My first object was to secure stout

spar-timber for pallisading a great extent of open ground, between the gates called *Palace* and *Hope*, and again from Cape Diamond half-bastion, along the brow of the Cape towards the Castle of St. Lewis. I accordingly succeeded in securing from *M. Lafléche's* timber-yard as much spar-timber as I required at three farthings a foot. I made a beginning with fourteen Canadian carpenters at Palace Gate, in pallisading with loopholes for musketry, and made a projection in the form of a bastion as a defence for the line of pickets, in the gorge of which I erected a block-house, which made a good defence. While employed at this station of the works, a company of artificers arrived from Halifax, and another from Newfoundland joined me soon after. The Halifax men I set to work at pallisading the open ground on Cape Diamond, and framing and erecting a large block-house on the outside of Port Louis, to serve as a captain's nightly guard-house, in order to be prepared against a surprise; also a block-house on the Cape under Cape Diamond bastion; at the same time a party was employed in laying platforms and repairing embrasures. I also had a party of carpenters *barricading the extremities of the Lower Town* by blocking up the windows of the houses next to the river side and those facing the water, leaving loopholes for musketry in case the St. Lawrence shall freeze across. While these detached services were in progress, I was on horseback from the rising to the setting of the sun." In further illustration of this, as it will have an important bearing, Caldwell says: "Barriers were made between the Upper and Lower Town, and at the *extremities* of the Lower Town at *Sault-au-Matelot*, and at the other side at *Près-de-Ville*, which you may remember is *on the further side of the King's wharf, past the King's forges;* these posts were strengthened with cannon."

Mr. Thompson also writes, that "on the night of the 14th November Arnold paraded his men in front of Port St. Louis, about three hundred yards distant, and saluted the town with three cheers, in full expectation that the gates would be opened for their reception. At this juncture I was on Cape

Diamond bastion, and myself levelled and fired a 24-pounder at them, which had the effect of making them disperse and hastily retire to *Point-aux-Trembles*."

The blockade of Quebec continued from the 4th to 31st December—for it was nothing but a blockade, the artillery of Montgomery being, as we have seen, powerless. But as the season would not permit them to remain longer in the open field, and as they were suffering terribly from the ravages of small-pox, there remained only the alternative either to retire at once or to get possession of the city by escalade. Montgomery decided to attempt the latter, and the night of the 31st December was fixed on. The garrison were not, however, to be taken by surprise, for it so happened that on the 23rd, Major Caldwell's clerk, Joshua Wolfe, who had been taken prisoner at *Sans Bruit*, managed to escape, bringing with him an American, who gave information that ladders were prepared, and that the intention was to attack the town at several points simultaneously on the first favorable night. Being thus put on guard, a sharper look-out than usual was kept. On the morning of the 31st December Montgomery made his attack at four different points:—two from the front on the heights of Abraham, which were feints, while a column headed by Arnold was to advance under the heights along the St. Charles, and endeavor to force an entrance by *Sault-au-Matelot*; and Montgomery himself was to lead the fourth between the St. Lawrence and Cape Diamond, and force the barricade at *Près-de-Ville*. The night was dark and drizzly, a light snow or sleet falling. About 5 a.m., Captain Frazer, who had charge of the main guard, on returning from his round, gave information that there was brisk firing at Cape Diamond. Col. McLean, who was second in command in the garrison, requested Major Caldwell to take part of his corps there, and if it should prove a feint, as was supposed, to leave any reinforcement that he might think necessary and return with the rest. We now give Caldwell's words:—"I accordingly went there, found the enemy firing at a distance, saw there

was nothing more serious intended, and, after ordering a proper disposition to be made, proceeded to *Port Louis*. There I met Captain Laws, to whom the General had given the command of an extra picket, composed of the best men of the detachment of the 7th and McLean's corps there; him I ordered back again to wait the General's orders, and proceeded to St. John's gate, where I first learned that the enemy had surprised the post at *Sault-au-Matelot*, and had got into the Lower Town." We will have to stop Caldwell's narration and accompany Arnold. Proceeding by the way already indicated, at the head of six hundred men, he assaulted with great impetuosity the first barrier, which he forced after a slight resistance; but here Arnold was wounded, and had to be carried to the General Hospital. The command devolved on Captain Morgan, who, driving the guard before him, advanced to the second barricade, about two hundred yards further on. We now resume *Caldwell's* narrative:—"I still had part of the British militia with me, and took upon me also to send some of those whom I found unnecessary on the ramparts to the party to wait for orders; and took an officer with a small party of the Fusiliers with me by Palace Gate, just at the time when the officer I had mentioned to you, with about seventy men, was ordered to make a sortie, and attack the enemy at the *Sault-au-Matelot* in the rear. I hastened with what expedition I could by the back of the Hotel-Dieu in the Lower Town, and on my way passed by the picket drawn up under the field-officer of the day, who was Major Cox, formerly of the 47th, and now Lieut.-Governor of Gaspé. I got him to allow me to take your friend Nairne with a subaltern and thirty men, and then proceeded to the Lower Town, where I found things, though not in a good way, not yet desperate. The enemy had got in at the *Sault-au-Matelot;* but, neglecting to push on, as they should have done, were stopped at the second barrier, which our people got shut just as I arrived. It was so placed as to shut up the street of *Sault-au-Matelot* from any communication with the rest of the Lower Town. As I was coming up, I found our

ople, the Canadians especially, shy of advancing towards e barrier, and was obliged to exert myself a good deal. To old *Voyer*, their colonel, justice, though he is no great ficer, he did not shew any want of spirit. However, my ming up with Nairne and a lieutenant with fifty seamen ve our people new spirits. I posted people in the different uses that commanded the street of *Sault-au-Matelot*—some the house where Levy, the Jew, formerly lived; others at ymburner's. The officers of the Fusiliers I posted in the eet with fixed bayonets, ready to receive the enemy in case ey got on our side of the barrier; they had on their side of it ed some ladders, and then another to our side, as if to me down by, that was useful to us. I ordered it to be lled away, and fixed it to a window in the gable-end of a use towards us, the front of which commanded the street of *ult-au-Matelot* and their side of the barrier. Then I sent *aptains Nairne* and *Dambourges*, an officer also of McLean's rps, with a party of their people. *Nairne* and *Dambourges* tered the window with a great deal of spirit, and got into e house on that side just as the enemy was entering it by e front door; but *Nairne* soon dislodged them ith his bayonets, driving them into the street; nor did ey approach the barrier afterwards. They, however, kept a brisk fire, from the back windows of the houses they cupied in *Sault-au-Matelot* street, on our people in ymburner's house on his wharf, and the street adjacent, m one of their houses. Their fire, however, slackened a od deal about nine o'clock, especially after I brought a ne-pounder on Lymburner's wharf to bear upon them, the t shot of which killed one of their men and wounded other. I then called on Nairne, in their hearing, so that he ould let me know when he heard firing on the other side. ur General had sent five hundred men to hem the enemy in that side. They soon after began to give themselves up, d surrendered to Nairne, who sent them through the window us. They then began to crowd in, in such numbers that opened the barrier, and they all gave themselves up on

that side. Thus ended our attack on that side, in which the enemy had twenty men killed, upwards of forty wounded, and about four hundred made prisoners."

This is the most succinct and reliable account yet published, and is contained in a letter addressed in 1776 by Caldwell to his friend General Murray, and which was published by the Literary and Historical Society of Quebec, under the superintendence of Mr. LeMoine, who, in a note, says that "It was there that an athletic Canadian, named *Charlant*, distinguished himself, together with Captains *Dumas* and *Dambourges*." We do not know on what authority Mr. LeMoine made his note, but give it as we find it, being desirous that credit should be given where it is justly due. *Garneau* has given a somewhat different account of the affair. We now give a translation of it:—"About this time General Carleton sent an order to Major *Nairne* and Captain *Dambourges* to go with a strong detachment to sustain the troops then engaged in the Lower Town. As soon as the reinforcement arrived it was decided to act on the offensive, and to attack the houses occupied by the enemy. In consequence, Captain *Dambourges*, with the *Canadians*, leaped over the barricades and planted the ladders brought by the Americans against the first house occupied by them, and took it by assault. Major Nairne did the same on his side. These two officers entered successively, in the same manner, the adjoining houses, one after the other." *Sanguinet*, a contemporary, like Caldwell, has recorded that M. *Dambourges* mounted by a window by means of a ladder which had been brought by the enemy, and, followed by many *Canadians*, burst through the window in the gable of the house. He found there many *Bostonnais*. After giving them *a discharge of muskets*, he drove them out with the bayonet, and entering the chamber with many *Canadians*, animated with a courage like his own, threw themselves with such energy on the *Bostonnais*, that they surrendered themselves prisoners." We also find in the journal [illegible] English officer of the garrison as follows:—"Major Na[illegible]

of the *Royal Emigrants*, and *M. Dambourges*, of the same corps, by their gallant behaviour attracted the attention of everybody. The General ordered them with a strong detatchment to the support of those already engaged in the Lower Town. These two gentlemen mounted by laddres, and took possession of a *house, with fixed bayonets*, which the rebels had already entered, and thus secured a post which overlooked a strong battery on the wharf and commanded a principal street."

Many years afterwards, in 1822, when an effort was made to secure, through Lord Dalhousie, a pension for the surviving daughters of Lieut. Dambourges, the veteran *James Thompson* was applied to, to certify, and did so as follows:—"That the enemy made an attack on the Lower Town in the morning of the 31st December of that year, when Lieut. Dambourges, with the late Lieut.-Colonel Nairne, did, by the means of a ladder, enter through the window of a house in Sault-au-Matelot street, then occupied by the enemy; and by this bold attempt the enemy abandoned the house; and by this, Colonel Nairne's party, which followed him and *Dambourges* through the *same window*, and by another party arriving warily at the same time at the north end of the street, that part of the enemy were made prisoners." This is the story of the defeat of Arnold's command at Sault-au-Matelot. Though told somewhat differently by the several narrators, it is evident that both *Nairne* and *Dambourges* conducted themselves as men of valour and discretion. That the British Government thought that Dambourges deserved well, is apparent from the fact of his having, though a native of old France, been appointed to a lieutenancy in the 84th regiment.

We now must turn our attention to what had been going on at the same time at the other extremity of the Lower Town at *Près-de-Ville*, which, from its disastrous termination to the gallant Montgomery, has generally attracted more attention than the attack by Arnold, though it has not generally been so [illegible].

At the spot indicated, and which is now pointed out to the tourist by a board, with inscription, attached to the rock, the abrupt precipice of Cape Diamond projects forward to the river, forming now, as then, a narrow defile. Here, under the direction of Mr. Thompson, a barrier had been erected, and a battery of four 3-pounders and one 4-pounder placed in a *hangar* or outhouse on the south side, which completely commanded the pass. Hawkins says: "The exact spot where the barrier was erected, before which Montgomery fell, may be described as crossing the narrow road under the mountain, immediately opposite to the west end of a building which stands on the south, and was formerly occupied by Mr. Racey as a brewery. It is now numbered 58. At the time of the siege this was called the *Potash*. The battery extended to the south end, nearly to the river." There is little change in the natural features of the spot, though there is in the houses; but there would be no difficulty in recognizing it, even if it were not pointed out in the manner mentioned. The defence of this post was entrusted to a *Canadian* militia officer, *Captain Chabot*, with thirty Canadian and eight British militiamen. There were also associated with him, as artillerymen, a master of one of the transports, *Captain Barnsfare*, with nine seamen. Mr. LeMoine says, "this is an error: *two Canadian* militia officers were in charge of this post;" and he quotes *Sanguinet*, who says: "Then *MM. Chabot* and *Alexandre Picard*, who commanded that day the guard, gave the order to fire the cannon charged with grape." Mr. Chauveau also has written: "Below us, at the foot of that tower on which floats the British flag, *Montgomery and his soldiers all fell, swept by the grape-shot of a single gun pointed by a Canadian artilleryman.*"

Hawkins's account is undoubtedly the best given by an English authority. He tells us that Montgomery, at the head of *seven hundred* men, advanced to the attack. "At break of day, some of the guard, being on the look-out, discovered, through the imperfect light, a body of troops in full march from Wolfe's cove, upon the post. The men had been under arms, awaiting with the utmost steadiness for the attack,

which they had reason to expect from the reports of deserters; and in pursuance of judicious arrangements which had been previously concerted, the enemy was allowed to approach unmolested within a small distance. They halted about fifty yards from the barrier; and as the guard remained perfectly still, it was probably concluded that they were not on the alert. To ascertain this, an officer was seen to approach quite near to the barrier. After listening a moment or two, he returned to the body, and they instantly dashed forward, at double-quick time, to attack the post. This was what the guard expected: the artillerymen stood by with lighted matches, and *Captain Barnsfare* at the critical moment giving the word, the fire of the guns and musketry was directed with deadly precision against the head of the advancing column. The consequence was a precipitate retreat: the enemy was scattered in every direction: the groans of the wounded and dying were heard; but, nothing certain being known, *the path continued to be swept by the cannon and musketry for the space of ten minutes.* The enemy having retired, *thirteen* bodies were found in the snow; and Montgomery's orderly sergeant, desperately wounded, but yet alive, was brought into the guard-room. On being asked if the General himself was, the sergeant evaded the question by saying that he had not seen him for some time, though he could not but have known the fact. This faithful sergeant died in about an hour afterwards."

Mr. James Thompson has left an account somewhat different from the others; he says:—"The path leading round the bottom of the rock on which the garrison stands, and called *Près-de-Ville*, was then quite narrow, so that the front of the line of march could present only a few files of men. The *sergeant* who had charge of the barrier-guard, *Hugh McQuarters*, (where there was a gun kept loaded with grape and musket-balls, and levelled every evening in the direction of the said path,) had orders to be vigilant, and when assured of the approach by any body of men, to fire the gun. It was General Montgomery's fate to be

among the leading files of the storming party; and the precision with which *McQuarters* acquitted himself of the orders he had received, resulted in the death of the General, two aides-de-camp, and a sergeant—at least these were *all* that could be found after the search made at dawn of day, next morning. *There was but one discharge of the gun*, from which the General had received a grape-shot wound in his chin, one in the groin, and one through the thigh, which shattered the bone."

Mr. LeMoine has attached this note to Thompson's relation: "There were other Canadian worthies who can legitimately share the credit of this *fait d'armes—Chabot*, *Coffin*, and the captain of an English transport, *Barnsfare*."

Here is *Caldwell's* account of it:—"In the meantime, Montgomery made his attack at *Près-de-Ville;* rockets were thrown up as a signal to Arnold that both attacks might be made at the same time. He got past some pickets, where we at first established our advanced posts. The guard was alarmed in time, and prepared for his reception; but the post was much stronger than I believe he imagined, and defended by four cannons there, and a four-pounder: *they were served by some seamen*, under the orders of the master of the transport; his name was *Barnsfare*. The guard was under the command of a *Canadian* officer of militia—the men, *Canadians* and *British*, being mixed. Barnsfare declared he would not fire till he was sure of doing execution, and, with the utmost coolness, waited till the enemy came within his view, at about thirty yards' distance, where they received *a general discharge from the cannon and musketry*. Nothing but groans were heard, and the rebels immediately retired, their General, his Secretary, two or three other officers, and about five privates, being killed on the spot; their wounded got off."

It is proper to give *here* what Hawkins has said on a point of some interest:—"Soon after the repulse of the enemy before the post at *Près-de-Ville*, information was given

to the officer in command there, that Arnold's party from the General Hospital, advancing along the St. Charles, had captured the barrier at the *Sault-au-Matelot*, and that he intended an attack on that of *Près-de-Ville* by taking it in the rear. Immediate preparations were made for the defence of the post against such an attack, by turning some of the guns of an inner barrier, not far from the old Custom-House, towards the town; and though the intelligence proved false—Arnold having been wounded, and his division captured—yet, the incident deserves to be commemorated, *as affording a satisfactory contradiction* to some accounts which have appeared in print representing the guard at *Près-de-Ville* as having been paralysed by fear, the post and barrier 'deserted,' and the fire which killed Montgomery merely 'accidental.' On the contrary, the circumstances which we have related, being *authentic*, proved that the conduct of the *Près-de-Ville* guard was firm and collected in the hour of danger, and that, by their coolness and steadiness, they mainly contributed to the safety of the city."

It was not ascertained till next day that General Montgomery had been killed, when General Carleton sent to the Seminary to enquire if any of the American officers, prisoners, could identify the body. A field-officer of Arnold's division, who had been captured that morning, proceeded with a party to *Près-de-Ville*, and at once identified the body. *Thompson* says:—"The snow had fallen on the previous night about knee-deep; the only part of a body that appeared above the level of the snow was that of the General himself, whose hand and part of the left arm were in an erect position; but the body itself was much distorted, the knees being drawn up towards the head. The other bodies that were found at the moment were those of his *aides-de-camp*, Cheesman and McPherson, and one sergeant. The whole were frozen hard. Montgomery's sword (and he was the only officer of the army who wore a sword, that I ever perceived,) was close by his side; and as soon as it was discovered, which was by a drummer-boy, who made a snatch at it on the spur of the

moment, and no doubt considered it as his lawful prize; but I immediately made him deliver it up to me, and some time after I made him a present of seven shillings and six-pence by way of prize-money."

I have searched to see if I could find anything from Carleton himself, and have found in the *Quebec Gazette* the following:

(*Copy of Letter from General Carleton to General Howe, dated Quebec, Jany.* 12, 1776.)

"SIR,—The 5th of December, Mr. Montgomery took post at St. Foy, within less than two miles of Quebec, with some field-artillery; his heavy cannon were landed at Cap Rouge; at the same time Arnold's party took possession of the other avenues leading to the town, and prevented all communication with the country. The 7th, a woman stole into town with letters addressed to the principal merchants, advising them to an immediate submission, and promising great indulgence in case of their compliance. Inclosed was a letter to me in very extraordinary language, and a summons to deliver up the town. The messenger was sent to prison for a few days, and drummed out.

"To give more efficacy to these letters, five small mortars were brought to St. Roch's, and a battery of five cannon and one howitzer raised upon the heights, within about seven hundred yards of the walls. Soon after, Arnold appeared with a white flag, and said he had a letter for me; but he was refused admittance, and ordered to carry back his letter.

"After every preparatory stratagem had been used to intimidate our wretched garrison, as Mr. Montgomery was pleased to call it, an assault was given the 31st December, between four and five in the morning, during a snow-storm from the north-east. The alarm was general; from the side of the River St. Lawrence, along the fortified front round to the bastion, every part seemed equally threatened. Two real attacks took place upon the Lower Town—one under Cape Diamond, led by Mr. Montgomery; the other by Mr. Arnold, upon the part called the Sault-au-Matelot. This at first met with some success, but in the end was stopped. A sally from the Upper Town, under Captain *Laws*, attacked their rear, and sent in many prisoners. Captain *McDougal* afterwards reinforced this party, and followed the rebels into the post they had taken. Thus, Mr. Arnold's corps (himself and a few others excepted, who were wounded and carried off early,) were completely ruined. They were caught, as it were, in a trap; we brought in their five mortars and one cannon. The other attack *was soon repulsed with slaughter*. Mr. Montgomery was left among the dead.

The rebels have, in this assault, between six and seven hundred men between forty and fifty officers killed, wounded, and taken prisoners. had only one lieutenant in the navy, doing duty as captain in the rison, and four rank and file killed, and thirteen rank and file wounded; of the latter are since dead.

You will be pleased to transmit a copy of my letter to the Secretary State, by the first opportunity, for His Majesty's information.

"G. C."

Received at Whitehall, from Major Caldwell, June 10, 1776.]

Mr. Thompson has left an interesting account how, under superintendence, the body was removed to *Gobert's* house, r the corner of St. Louis street and the Esplanade, where vas again identified by Mrs. Prentice, who then kept 'ree-Masons' Hall," (where Montgomery had been in the bit of putting up during his visits to Quebec,) who was abled to recognize the body by a scar on one of his cheeks, posed to be a sabre-cut. By the orders of General rleton, Mr. Thompson had the body buried near his first e, (within and near the surrounding wall of the powder gazine, in the gorge of St. Lewis bastion,) where it nained till 1818, when, a request having been made to neral Sherbrooke by the General's widow for the body her husband, Mr. Thompson, then in his 77th year, was in called upon, and pointed out the place where the body , and, in presence of Mr. Lewis, nephew of the General, ief-Justice Sewell, and some officers of the garrison, sed it to be exhumed. Mr. Thompson, on delivering the dy to the relatives, made affidavit as to its identity. The davit has been long before the public, and is very eresting.

To return to the main narrative:—On the failure of these empts, and in consequence of the death of Montgomery, command having devolved on Arnold, he resolved that siege should resume its character of blockade, with which rleton seemed well content, as he made no attempt follow up his success by any operation without the walls,

but contented himself by still further strengthening the accessible points in the Lower Town. The blockading army, which had been greatly reduced by small-pox, &c., and which, after the repulse of the 31st, remained encamped three miles from the city, was reinforced in March, and its numbers brought up again to 2,000. In the beginning of April, Arnold was relieved of the command at Quebec by General Wooster, and proceeded to the command at Montreal. Wooster approached nearer the walls, erected batteries, and re-opened fire on the city, but with no better success than attended the attempt at the commencement of the siege. On the night of the 3rd May an unsuccessful attempt was made by a fire-ship to destroy the ships-of-war and transports lying at the *Cul-de-Sac*, and they hoped that during the confusion they might be successful in an attack on the city by escalade. On their failure, as they had reason to know that aid was hourly expected by the garrison from England, they gave up all hope of success. On the 6th of May, to the great joy of the British, the frigate *Isis* came to anchor in the roads, and Lord Petersham, with the grenadiers and a small party of the 29th, and some marines,—in all, amounting to about 200 men,—landed. A sortie, consisting of from 1,000 to 1,200 men, was at once organized. The enemy was found in full retreat, and a few straggling shots were interchanged without any damage. It was suggested to General Carleton, through his brother, Major Carleton, to make an attempt to cut off the retreat; but "he steadily adhered to his resolution of running no risk as to the safety of the place." No person was more ready than he was, at all times, to expose his person; his *timidity* was only shewn in respect to others and the safety of the town. Other people in his situation, perhaps, might have extended their views to the recovery of the country, and to the operations of the summer campaign. "I confess," says Caldwell, "those ideas struck me in the course of the winter." General Carleton thought and acted differently, and shewed that he felt that the arrival of the *Isis* and the

retreat of the Americans had changed "the winter" of discontent "to glorious summer." The Americans abandoned their stores, artillery, and scaling-ladders; *also their sick*, of whom they left a great many to the care of the British. That they were humanely treated we are happy to know has been acknowledged by Chief-Justice Marshall in his *Life of Washington*. This attempt to take Quebec has been pronounced by some as rash and foolhardy; but many agree with Sir James Carmichael, that, though there were undoubtedly errors of detail, especially in making the real instead of the feint attacks at *Sault-au-Matelot* and *Près-de-Ville*, instead of from the plains of Abraham, "*the attempt was soldier-like and enterprising*. But it was not attended with such risk as at first sight appears. Congress had been assured of the sympathy and active co-operation of a large portion of the population; and, as we have seen, some influential persons of English descent were much inclined to join the invaders. General Carleton was fully aware of this. He knew that the priests were generally in his favor, and refused to confess the Canadians in the rebel interest; but he also knew that for this they had lost influence. Here is one notable example:—Having great confidence in the loyalty and discretion of a Canadian gentleman, M. de Beaujeau, then residing on the *Isle-aux-Grues*, he wrote him to assemble some of his countrymen, and cut off the American guard at Point Levis. M. DeBeaujeau succeeded in mustering about 150 Canadians, but they were betrayed by their disaffected fellow-countrymen, and thirty, who had assembled in a house, were surrounded and taken prisoners; and Messire Bailly, a priest, who stood high in the confidence of several Governors, was shot through the body, and also taken prisoner, though he was shortly released, and recovered.

The conduct of General Carleton during the siege raised him much in general estimation. During the attack of the 31st Dec. he took post at Prescott Gate, the supposed post of danger, as undoubtedly there the great struggle

would have taken place if Montgomery and Arnold had succeeded at the barriers. That he was disposed to do justice to all parties, his despatch, forwarded to the English ministry by Col. Caldwell, proves. In that despatch he makes special mention of *Col. Dupré*, *Major Ecuyer*, and *Captains Bouchette*, *Laforce*, and *Chabot*, of the marine, all Canadians, and gives them credit generally in this sentence: "The militia, British and Canadian, behaved with a steadiness and resolution that could not have been expected from men unused to arms."

Colonel Dupré, who was in command of the Canadian militia during the siege, and secured the favorable notice of the General in his despatch, was subsequently appointed, in reward, to a high command in the militia, and always proved himself a good and loyal subject. *Lieut. Dambourges*, a native of old France, we have already seen, was presented with a lieutenancy in the 84th, in recognition of his merit.

Major Caldwell, whose private letter to Murray, since published by the *Literary and Historical Society*, and from which I have made such frequent quotations, is thus mentioned in the despatch:—"Major Caldwell, who commanded the British militia all winter, as lieut.-colonel commandant, and is bearer of these despatches to your Lordship, has proved himself a faithful subject to his Majesty, and an active and diligent officer." This testimony adds very greatly to the weight of the statements which he has made, and of the things which he knew and had seen. The services of General Carleton were not overlooked: he was at once made a Knight of the Bath, and subsequently became Lord Dorchester. He was no less than four times intrusted with the government of Canada.

Montgomery and Arnold had failed in the attempt to subdue or *annex* Canada; but their merits were truly estimated by Congress. Montgomery had fallen, but his *fall* was glorious, and his adopted country raised a monument to

his memory; and even the representatives of the country that he had opposed—his own native country—did homage in parliament to his virtues. Montgomery was an Irishman by birth, and first served with his regiment, the 17th, at the capture of Louisbourg. Whether he was with Wolfe at Quebec is now doubtful, though it has been so stated by some of our best historians and biographers. He served also with his regiment at the capture of Martinico and Havannah, and did not leave the service of his native country till he sold his commission in 1772, when he went to the State of New York. He married Miss Livingston, daughter of Judge Livingston, of Livingston Manor, on the North River, and was living happily with his wife when the Revolution, in which he, from the first, took a prominent part, commenced. He was a man of excellent parts and disposition, esteemed in private life for his amiable qualities, and secured the confidence of his adopted country by his public conduct.

Of his comrade in arms, General Arnold, we shall only say that it would have been well for him had he also fallen at Quebec—that he had never survived the wound he received there: he would then have been only known as a brave, energetic, and honorable soldier and commander; and *Jared Sparks* would have been saved the painful task of writing "THE LIFE AND *Treason* OF BENEDICT ARNOLD."

Paper IV.—GEOMETRY, MENSURATION, AND THE STEREOMETRICAL TABLEAU.

By CHARLES BAILLAIRGÉ, Esq., Civil Engineer, etc.

(*Read before the Society, March 20th, 1872.*)

No apology, I presume, need be offered for my selection of the subject of which I am about to treat; for, though, at first sight, it may appear to be devoid of interest and practical utility, it is, on the contrary, fraught with paramount importance on account of its relationship to almost all the industries of life.

Geometry is the basis of our public works; to its precepts we are indebted for all the constructive arts, our public edifices, our dwelling-houses, the fortifications of our cities, our ports, canals and roads, and the wondrous architecture of the many floating palaces and towers that thread our streams and rivers or plough the mighty seas. The geometer it is who measures and designs, in their true proportions, the diverse parts of states and territories, and who, by thus bringing together their several points, enables the eye to appreciate the consequences of their relative positions; he it is who directs the use of our engines of war, and to his calculations are made subordinate the movements of armies. Geometry makes the astronomer and guides the navigator, and all sciences are allied to it. It is the foundation of mechanics, hydraulics, and optics; and all the physical sciences are constantly indebted to it.

In a less elevated sphere, geometry teaches us to measure and design or represent our fields, our gardens, and domestic buildings; it enables us to estimate and compare their products and expenditure; it determines inaccessible heights and distances, guides the draughtsman's hand, and presents an infinity of detached usages, often applicable in domestic economy.

The fairer portion of mankind have the keenest, most appreciative perception of its advantages and beauties, as evidenced in the ever-varying combinations so cunningly devised in their designs for patch-work, laces, and embroidery, etc.

Geometry measures extension, comparing portions of space with each other. Its elements are lines, surfaces, and volumes or solids. A portion of space, such as might be filled by a solid body, is itself called in geometry a solid. The boundaries of this geometrical solid are called surfaces, which last may also be conceived as separating space from space as well as bounding it. They constitute a zero of solidity, but have a magnitude of their own, called superficies. It is sometimes suggestive and advantageous, in reasoning about solids and their mode of measurement, to consider them as made up of an infinite number of surfaces or superficies overlying one another like the leaves of a book. If a surface be limited in extent, the boundary on any side is a line, which has neither solidity nor superficial area, having magnitude in length only. Surfaces or superficies may be conceived to be made up of an infinity of lines in juxta-position to each other. If the line is limited in extent, its extremities are points. A point, therefore, is a zero, not only in solidity and superficies, but in length also, having no magnitude or proportion, and retaining only order or position as the sole element of its existence. A line may be conceived as made up of an infinite series of points following each other in close contact or succession. In the position of points, the difference in direction of a first and second point from a third is called an angle. We have here all the elemental conceptions of geometry, viz., a point, a line, a surface, a solid, an angle. From these definitions as data, a vast amount of geometrical science may be deduced by the laws of logic.

The relation of geometry to other sciences is twofold, giving and receiving. To mechanics it gives the only possibility of understanding the laws of motion; and from mechanics

it receives the conception of moving points, lines, and surfaces, and thus generating lines, surfaces, and solids. To chemistry it gives the only means of investigating crystallization, polarization, &c., and from chemistry receives new ideas concerning the symmetry of planes. It holds a like relation to botany and zoology in the laws of form and morphology. In the study of the human mind, geometry proposes the question of the foundations of belief, by giving the first examples of demonstration; and from the inquiries thus aroused geometry has received from age to age the new conceptions which have been the base of many new methods of investigation and proof. To theology geometry gives definite conceptions of the order and wisdom of the natural creation, and from theology has been stimulated to many fresh exertions in the investigation of these theological questions.

The history of geometry is divided by Chasles, in his valuable "*Aperçu historique des méthodes en géométrie*," into five periods. The first is that of the Greek geometry, lasting about 1000 years, or till A.D. 550. Then, after a pause of 1000 years, the second period began in the revival of ancient geometry about 1550. A third period was marked in the beginning of the 17th century by Descartes' co-ordinates and the analytical geometry. The fourth period was inaugurated in 1684 by the sublime invention of the differential calculus. The fifth era is marked in our own century by Monge's "Descriptive Geometry," by which he developed the idea of reducing the problems of solid geometry to problems in a plane. One beautiful example of this branch of science may be found in linear perspective, which simply projects the points of a solid upon a plane by straight lines of light from the eye.

Since Chasles' "*Aperçu Historique*" was published, a sixth period has been introduced by the publication of "*Hamilton's Quaternions.*"

Greek geometry, it is said, began with Thales and Pythagoras, who obtained their first ideas from Egypt and from India. Diodorus, Herodotus and Strabo are of opinion that the science of mensuration had its rise among the Egyptians, whom they represent as constrained, on account of the removal or defacing of the land-marks by the annual inundation of the Nile, to devise some method of ascertaining the ancient boundaries, after the waters had subsided. Indeed, the science must have been nearly coeval with the existence of man, for we are told in Holy Writ that Cain built a city; to do which, it is evident, would require some knowledge of a measuring unit, which is the first principle of mensuration. By the same infallible testimony we find that the arts and sciences were cultivated to a considerable extent long before the flood. Jubal was the father of all such as handled the harp and organ, and Tubal-Cain an instructor of every artificer in brass and iron. It is also more than probable that Noah was well acquainted with geometry as practised in his day, for it does not appear that he found any difficulty in building the ark. Be this as it may, it is well known that Egypt was for many ages the mother and nurse of the arts and sciences. From this country they were conveyed into Greece by Thales, about 600 years before the Christian era. Euclid, about 300 years before Christ, established a mathematical school at Alexandria, where Archimedes, Apollonius, Ptolemy, Theon, etc., received instruction from the "prince of geometers." It is, however, reasonable to suppose that before Euclid's time there existed treatises on geometry, for Proclus affirms that Euclid improved many things in the elements of Eudoxus and in those of Theatetus, and established, by the most firm and convincing demonstrations, such propositions as were but superficially explained.

The Pythagorean school demonstrated the incommensurability of the diagonal of a square with its side, and investigated the five regular solids. They had some knowledge of triangles and circles, and were probably acquainted with

the fact that the circle and sphere are the largest figures of the same perimeter and surface. About a century after Pythagoras the great Plato and his disciples commenced a course of rapid and astonishing discoveries. The ancient analytic mode of geometrical reasoning consisted in assuming the truth of the theorem to be proved, and then shewing that this implied the truth of those propositions only which were already known to be true. In modern days, the algebraic method, since it allows the introduction of unknown quantities, has taken the name of analytic. Conic sections embrace, as is well known, the study of the curves generated by intersecting a cone by a plane surface; and most marvellous, so to say, are some of them. The circle, the most beautiful of all, we see exemplified in the thousand-and-one forms of every-day life. The ellipse, this almost magic curve, is traced out in the heavens by every planet that revolves about the sun, by every satellite about its primary. It has two centres or foci, the sun or primary in one of them. It approaches in these cases nearly to a circle, or has little eccentricity, while, as in the case of comets, it is lengthened out almost indefinitely. It is produced whenever the intersecting plane cuts the cone in a direction oblique to its axis, the angle formed by this section and the cone's base being at the same time less than that included between the base and side. In imitation of the Divine Architect, man has made it subservient to his requirements; we see it in the arches of all sizes that span our rivers and crown our structures, great and small. The artist applies it as a fitting frame to that most beautiful of ovals, the face of lovely woman. It has very peculiar properties: for instance, the sûm of any two lines or radii drawn from its centres to any point in the circumference or perimeter of the figure, is a constant quantity; and a ray of light or sound or heat thrown out or radiated from one of its foci towards the circumference, is reflected to the other focus. You have all heard of the whispering gallery in St. Paul's Cathedral: it is merely an elliptical space surrounded by walls, in which, when two

persons stand in the opposite foci, and though comparatively far apart, they can talk to each other in the merest whisper, and without the least danger of being overheard by any other person within the gallery. We have, next, the hyperbola, a peculiar curve, in which not the sum is constant, but the difference of any two radii or lines drawn from the foci to a point in the curve. We obtain it in the cone when cut by a plane at an angle greater than that which the side makes with the base. It is, in a popular sense, a somewhat paradoxical figure, inasmuch as though it be produced ever so far, and in so doing it approach more and more to two certain lines called its asymptotes, and though the lines be close by, yet can it never reach them, even though it should continue onward until the end of time. It has not, in practice, the importance of the other conic sections, but has some uses, such as that of expressing or affording an illustration of the varying pressure of steam while working expansively within a cylinder or other vessel.

Come we now to the parabola, a marvellous curve, indeed. How singular that this figure, which every cone presents when cut by a plane parallel to its side, should be that in which certain comets visit our system—those that enter it but once, and leave it again, never more to return; for it is a curve which, like the hyperbola, but unlike the circle or ellipsis, returns not back upon itself, but of which the opposite sides or branches continually separate more and more, never to meet again. This is, indeed, a most fascinating curve. How very strange that it should happen to be the self-same figure which a stone describes when, thrown obliquely into space, it falls again! An acquaintance with the theory of this most useful arc guides the gunner in throwing his balls and shells into the fortress of the enemy; for, see you, such a curve as they describe when ascending into space, the self-same curve they make again while falling to their destination—the whole arc or curve a true parabola, and each portion thereof the exact half or counterpart of its fellow. Yet, I have not done telling you about this most

interesting section. Every jet of water or other liquid issuing under pressure from the side of a reservoir or cistern, or from the pipe of a fire-engine, describes this curve; and hence the distance of projection can be in advance calculated and ascertained. But it has still other applications, to wit: in the construction of the speaking-trumpet, where the mouth lies in the focus of the curve (for it will already have been guessed from the description that it has but one), and the rays of sound striking upon the sides of the tube are projected forth together in a pencil or bundle, so to say, parallel to one another, and direct towards the object spoken to. See, again, this curved line in the mirror which collects the parallel rays of the sun, or other source of light or heat, and reflects them one and all from the surface to the centre or focus, wherein a light or fire may be thereby kindled; and again, in the reflector which, in light-houses, gathers the diverging rays proceeding from the focus, and sends them off together on their errand of humanity. But I, too, am wandering, I find; and though the curve return not upon itself, I must not further follow it in its erratic course.

Within 150 years after Plato's time, this study of the conic sections had been pushed by Apollonius and others to a degree which has scarcely been surpassed by any subsequent geometer.

Geometrical loci are lines and surfaces defined by the fact that every point in the line or surface fulfils one and the same condition of position. Thus, the locus of a point equally removed from any two given points, is the perpendicular drawn from the centre of the line joining these two points; the locus of the vertices of all triangles having the same base and equal areas is a line parallel to the base; the locus of the vertices of all triangles having the same base, and the same ratio between their sides, is the circumference of a circle having its centre in the base produced, and such as to cut it in the required ratio. The investigation of such loci has been, from Plato's day to the present, one of the most

fruitful of all sources of geometrical knowledge. Just before the time of Apollonius, Euclid introduced into Geometry a device of reasoning which was exceedingly useful in cases where neither synthesis—that is, direct proof—nor the analytic mode is readily applicable, the *reductio ad absurdum;* it consists in assuming the contrary of your proposition to be true, and then shewing that this implies the truth of what is known to be false. Contemporary with Apollonius was Archimedes, who introduced into geometry the fruitful idea of exhaustion. By calculating inscribed and circumscribed polygons about a circle, and increasing the number of sides until the difference between the external and internal polygons became exceedingly small, Archimedes arrived at the first known ratio between the diameter and circumference of a circle, which he found to be as 1 to $3\frac{1}{7}$. Hipparchus, before Christ, and Ptolemy, after Christ, applied mathematics to astronomy. Vieta, the inventor of algebra, applied it to geometry. Kepler introduced the idea of the infinitesimal, thus perfecting the Archimedean exhaustion, and led to the solution of questions of maxima and minima. Meanwhile, Newton's Fluxions and Leibnitz's Differential Calculus had come into use, and many fine discoveries were made in regard to curves in general; and so fruitful the results, that, as is now well known by every one, the time of an eclipse of the sun may be calculated and foretold for years in advance, and that to the very minute—nay, to within a second almost—of its actual occurrence. Even the reappearance of a comet may be predicted to the very day it heaves in sight, and though it has been absent for a century. In former ages, when these phenomena were unpredicted, they burst upon the world in unexpected moments, carrying terror everywhere, and giving rise to the utmost anxiety and consternation, as if the end of all things were at hand.

Although the elements of Euclid are the groundwork of every mathematical education, yet, many valuable rules are deduced from the higher branches of analysis, and which

appear to have little or no dependence upon geometry. The differential analysis has admitted us to the knowledge of truths which would astonish mathematicians of former ages; and to Newton we are principally indebted for discoveries which have greatly advanced the art of mensuration. Artificers of all kinds are indebted to geometry and mensuration for the establishment of their various occupations; and the perfection and consequent value of their labors depend entirely on the near approach they make to the standard of geometrical accuracy. All the great and ingenious devices of mankind owe their origin to this sublime science. By its means the architect draws his plan and erects his edifice. When bridges are to be built over large streams, the most exact acquaintance with geometry is required. In the construction of ships, of every kind, geometrical knowledge is requisite; and the sailor well knows the use of a good astronomer on board his vessel to guide it through the trackless ocean. The sublime science of astronomy is built upon geometrical knowledge; and the telescopic observer keeps up, as it were, a conversation with the heavens. In short, all the elegancies of life, and most of its conveniences, owe their existence to the geometrical art. The vegetable world abounds with productions shaped with more than human cunning; the beautiful tracery observable in the petals of some flowers is really astonishing, and the most exact proportion of the parts is always preserved. In the mineral world, a similar truth forces itself upon the imagination; and wherever the eye of man has been allowed to penetrate, the same geometrical harmony is found among all the parts of created matter. And what is the foundation, the groundwork, upon which this science of geometry is built? Why, so to say, on but one or two elementary propositions, which, if the truths implied of them did not exist, the whole science must fail. One of these fund[illegible]ems is, that in every plane triangle the sum [illegible] is constant and equal to two right angles, or t[illegible] when any two of them are

known, the third is found with the utmost facility; and thus are we enabled to arrive at the distances which separate us from inaccessible objects, or which divide those objects from each other. It is thus that the surveyor and engineer, by the help of a base-line of measured length, and the angles observed at each extremity thereof, can, by an easy geometrical construction, or by arithmetical calculation, arrive at the exact breadth of a river which it is intended to bridge. Thus, also, does the astronomer, by adopting a broader base, arrive at the diameter of the earth we inhabit, without the necessity of going round it. The earth, in its turn, is made the basis for computing the distance of the moon, the sun, and the planets; and when, as in the case of the fixed stars, this basis fails,—when the astronomer at opposite ends of the earth, or with a base-line of some eight thousand miles in extent, fails to elicit any difference between the sum of the observed angles and two right angles, he bides his time, and, taking one of them on any convenient day, he takes the second that day six months, when, with the earth in its yearly revolution about the sun, he shall have arrived at the opposite end of the earth's orbit, and have thus secured a base-line of nearly 200,000,000 of miles in extent—though, even so, he is sorely tried, and has almost superhuman difficulties to encounter in solving this great problem of the distance of the stars; for,—will it be believed?—so tremendous, so inconceivable is this distance, that the third angle of the triangle—the one opposite to this immense base of 200 millions of miles—this third angle, I say, is but the fraction of a second, or of the $\frac{36}{100}$th part of a degree. And yet, strange contradiction, so very small is this enormous distance of the nearest fixed star, and from which light, though it travels with the inconceivable velocity of 200,000 miles in every second of time, requires three years to reach us,—so small is it, in comparison with this boundless universe, that there are stars ten times—aye, 10,000 times—more remote, and further still, beyond the space-penetrating

powers of the most potent telescopes, such as that of Lord Rosse, which is not less than six feet in diameter, and more than 60 feet in length.

And if this property of the triangle did not exist—if the sum of the three angles were not a constant quantity,—then should we probably have remained ignorant, and forever—not, perhaps, of the size of the earth itself, which may be girdled and submitted to direct measurement, but of the distances and sizes of all objects exterior to the earth or out of our immediate reach, and man deprived of one grand and inexhaustible source of enjoyment.

There is another property of triangles on which I must dwell for a moment: it is this, that when similar or equiangular, their homologous or corresponding sides are proportional; and from this property it occurs that in every right-angled triangle the square of the hypothenuse is equal to the sum of the squares upon the other two sides. These two propositions or theorems, together with the more important one already alluded to, are at the foundation, so to say, of all geometrical science; and all the other theorems and problems of geometry depend intimately upon these for their very existence or solution.

Because the sides and altitudes of similar triangles are proportional, it follows that their areas are as the squares of any of their corresponding dimensions. That is, if the base of a triangle be double that of another, so is its altitude also double; and as twice two are four, the area of the second is four-times that of the first; or if the base of the one be three-times that of the other, so will its altitude, and the area 3-times 3, or 9-times that of the first. Hence, while the lineal dimensions increase as the natural numbers 1, 2, 3, etc., the superficies increase as the squares 1, 4, 9, etc., thereof; and this affords a way of dividing any triangular figure or space into portions which shall be equal to each other, or bear to each other any required ratio. And what is true of similar triangles is also

true of all other similar figures—that is, of such as are made up of, or capable of being divided into, an equal number of similar and similarly situated triangles. Again, because every rectilineal figure may be divided into as many triangles as the figure has sides, less by two, and as the sum of the angles of each of the constituent triangles is equal to two right angles, therefore does it follow that the sum of the interior angles of any quadrilateral or four-sided figure is 4 right angles; of any pentagon, the sum of the angles is equal to 6 right angles; in an octagon, 12 right angles; and so on. This important property enables the land-surveyor or engineer, after measuring the angles of any tract of land, to test the accuracy of his triangulation, and detect an error, if there be one, since the sum of all the angles, when taken together, and whatever fractions of a degree or minute they may severally contain, must, of necessity, make up an exact number; and that number must be an even number of right angles—2, 4, 6, 8, 10, or 20, as the case may be,—but never 3, 5, 7, 9, or any other odd number.

I have alluded to the circle as being the most beautiful of all figures, but have as yet said nothing of some very useful properties with which it is endowed. For instance, an angle at its centre is measured by the arc which it subtends; this we all know, and that it should be so does not appear at all strange: it seems, on the contrary, that it should not be otherwise, and hence it suffices to define the thing, or to enunciate the proposition, to have it credited. But it is singular that when the apex of the angle is in or on the circumference, such angle is but one-half—not less, not more—of the corresponding angle at the centre; and out of this arises the very curious and useful property that all angles in the same segment are equal to each other; also, that every angle in a semi-circle is a right angle. Hence the possibility of drawing a tangent to a circle from any point without it; hence, also, can a right angle be most easily and readily laid out by the draughtsman on his board or paper, or by the surveyor in the field. Hence, again, can

the very pretty and useful problem be solved of finding a mean proportional or a geometrical mean between any two given lines, a graphic mode of extracting the square root of the product of any two given numbers, or of finding the side of a square equal in area to that of a given rectangle. But, in the same way as a geometric mean may be found between any two lines, so can either of these last be determined when the other is known and the mean between it and its fellow; and in this way is the engineer enabled to find the radius of a railroad curve, for these curves are usually of vast extent, and, unlike the circle on a board or sheet of paper, the centre cannot be seen nor found, nor can the radius be measured; or if you come across a portion of a stump, and have a curiosity to know the size of tree cut from it, draw any chord across it, bisect it, square its half, divide the product by the versed sine or height or breadth of the segment at its centre, and there will come the rest of the diameter. This is not all; for on a scale 10,000 times more vast, or even millions, does the astronomer compute, and almost in the self-same way, from a knowledge of a minute portion of the arc or orbit, those tremendous circles, eccentric though they be, which satellites sweep out around their primaries, and planets around the sun. Yes, and as the engineer, without a centre or a radius, can follow out his curved track among the woods and waters of the earth, so also does the astronomer trace out his mighty circuits through the starry forests of the dark blue heavens. Aye, even is the erratic comet in this way followed up with eye intent upon its ever-varying direction among the stars, and from the minutest portion of its circuit can the elliptic figure be computed which will enable the time of its periodic return to be predicted to a certainty; and the same course of observation will also tell if the path among the planets be not elliptic, but rather parabolic, or that of some strange meteor which is approaching this world's precincts for the first time, and will leave it, never to return—unless, to be sure, the path described should approach very nearly to the

elliptic, and, as in political astronomy, the influence or attraction of some great planet so swerve it on its way, so alter its direction, as to bring about the phenomena of a transformation.

I have just now said that the angle at the circumference of a circle is half the angle at the centre on the same arc, and this property can be turned to great account. In surveying the coast of any country, with a view to laying down on charts and maps its shoals and breakers, the hydrographer takes his angles from points immediately over those of which the positions are to be ascertained to three or more points on shore, of which the distances apart are known. Now, were the angles just alluded to adjacent to any one of the measured distances, the solution of the problem would reduce to that of determining the third angle and other two sides of a triangle, of which two angles and a side were known. But the elements are not in contact; they are not adjacent: how, then, can they be brought together for the purposes of calculation? Why, by this very beautiful property of the circle just enunciated—that an angle having its vertex in the circumference is equal to any other angle similarly situated and bearing upon the same arc, whereby, if a circle be described around three of the points concerned in the problem,—and, as we all know, a circle can be so described,—and if the two angles, taken from the hydrographical point under consideration, are made to travel round the circle till the apex of each of them arrive at the opposite extremities of the base, the whole difficulty will have been made to disappear, and the problem be reduced to that of solving a case in plane trigonometry. In this way did a former pupil of mine, Mr. R. Steckel, now of the Department of Public Works at Ottawa, solve, in a most ingenious and simple manner, the problem of the interpolation of a base-line, or of finding the unknown portion, B C, of a straight line, A B C D, to which three angles had been taken from a fifth point, P, of which the position was to be ascertained. This solution is given at

page 251 of my treatise on Geometry, etc., published in 1866; and at page 277 of the same work is a most ingenious solution of a rather difficult problem in the division of lands —that of a quadrilateral into equal or proportional areas, with sides also proportional to those of the whole figure.

There are yet a few other properties of the circle which I must notice ere I take leave of the subject. Thus, two tangents drawn to a circle from any point without it, are equal, and the tangent is perpendicular to that radius which is drawn to its point of contact; and from these circumstances, and the fact already enunciated, that the sum of the three angles of any triangle is equal to two right angles, it becomes possible to calculate the diameter of the earth by merely observing the angle of depression of the horizon from the top of a mountain or other elevated situation, the height of which above the earth's surface is known. A circle can always be described capable of containing a given angle on a given base; hence, for instance, if the height of the flag-staff on the citadel be known, and the angle it subtends from the opposite side of the river, together with the distance across, the height of the citadel itself may be computed. The geometrical solution or construction of this problem, as of many others of practical utility, is given at pages 232 to 331 of my treatise. Out of the fact that an angle at the circumference is half of that at the centre, there arises also the condition that to inscribe a four-sided figure in a circle, its opposite angles, taken together, must be equal to two right angles; and because any two lines or chords which cut one another in a circle have the parts of the one proportional to those of the other, the diameter or radius can be found of a circle of which a zone, or portion included between any two parallel chords, forms part. And, again, out of the circumstance that if two lines be drawn from any point without a circle to the opposite or concave side thereof, these lines are reciprocally proportional to their segments situated without the circle, there arises one of the modes of solving

that case of plane trigonometry where [illegible] sides of a triangle are given to find the angles [illegible] drawn from the same exterior point to the [illegible] mean, or a mean proportional [illegible] of the aforementioned lines and its exter[illegible] there arises a mode of running a railroad [illegible] through any two given points and tangent [illegible] curved portion of another road.

How much more which I have not time [illegible]—and yet how strange, that of this the most regular [illegible] figures, and which man has made subservient to so many purposes of practical utility,—this figure, which it is so very easy to trace out, neither has the circumference nor the area yet been found. Archimedes, as I have already said, found an approximate ratio for the diameter to the circumference, that of 1 to $3\frac{1}{7}$; Metius, a ratio of 113 to 355; and other mathematicians that of 1 to 3.141592, etc. In 1590, Ceulen, who lived in the time of Metius, extended the calculation to 36 decimals, which were engraven on his tomb. He arrived at this result by calculating the chords of successive arcs, each of which was the half of the preceding one; the last arc in this case being the side of a polygon of 36,893,488,147,419,103,233—nearly 37 billions of times 419 millions of sides. The mode of calculation was thereafter greatly simplified by Snell, who, with the help of a polygon of only 5,242,880 sides, carried the approximation to 35 places of figures. The computation was during the last century continued by other mathematicians, who successively carried the number of figures to 75, 100, 128, and 140 decimals.

Notwithstanding that Lambert, in 1761, and Legendre, in his elements of geometry, have proved that the ratio of the diameter of a circle to its circumference cannot be expressed in numbers, the desire to satisfy those who still hoped to find this ratio led other mathematicians to continue adding to these figures. In 1846, 200 decimals had been obtained, and

250 the following year. In 1851 the number was extended to 315; then to 350. Shanks carried it to 527, and in 1853 to 607 places of decimals. When it became evident that the arithmetical expression for this ratio was out of the question, many persons continued to hope for some geometrical solution to the far-famed problem: but it is generally recognized at present that this method is impracticable; and it must be admitted that there has resulted but trifling advantage, if any, from the enormous time and trouble devoted to this famous proposition. The French Academy of Sciences, in 1775, and, soon after, the Royal Society of London, with the view of discouraging such futile and fruitless researches, refused to take further notice of any communication relating to the quadrature of the circle, the trisection of an angle, the duplication of the cube, or perpetual motion. An approximation of 600 figures, or even less, is equivalent to perfect and absolute accuracy; for, let it be remarked, it suffices to take in 17 decimals only to avoid an error of the thousandth part of an inch on the six hundred millions of miles which constitute the length of the orbit of the earth around the sun. Ten decimals will afford the circumference of the earth to within an inch, and 13 decimals within the thousandth part of an inch, or less than a hair's breadth; and, at any rate, the figures already found more than suffice for the purpose of determining with absolute accuracy not only the dimensions and distances of the planets, but also of the most distant stars or nebulæ that man can discover with the help of the most powerful and space-penetrating telescopes, or of those which he might discover with optical instruments 10,000 times more powerful than those which he already possesses.

Alluding, again, to the celebrated problem of the trisection of an angle, I must once more take occasion to protest, thus publicly, as I have already done, though without result, at page 330 of my treatise of 1866, not against the pretended and ridiculous solution of this problem by a certain Mr. Thorpe, of Ottawa, after, as he says,—poor man!—devoting

34 years of his life to its discovery, but against the government of Canada—the Patent-office—for sanctioning the pretended solution by the issue of Letters-Patent corroborative of the same, and thus setting the opinions of the government officials before those of the numerous *savants* of Europe and other countries, who have, and had long before that time, declared the geometrical solution of this problem to be impossible—though there are, of course, as with the circle, modes of approximating to the true solution to within limits as narrow as any that can be assigned.

A few more remaks on some properties of certain plane figures, and I shall have done with this portion of my subject.

In parallelograms (I need not remind you what they are; their etymology is suggestive enough of that), Mr. Steckel shewed that each of the complements about the diameter is a mean proportional between the component parallelograms about the same, a property which I fortunately conceived the idea of applying (see page 190 of my treatise) to the solution of a problem of frequent occurrence in the division of lands by a straight line running through a given point. This problem was previously a matter of some difficulty, whether algebraically or geometrically considered (see page 519 to 522 of "Gillespie's Land-surveying," where the formula runs over three lines of type).

The regular hexagon or six-sided polygon is the only figure, exclusive of the square and equilateral triangle, which will fit together without leaving a space between, as does the octagon, for instance—a fact which may be seen exemplified in paper-hangings, in the patterns of oil-cloths, and in marble and mosaic tilings. Now, the very bee knows its geometry so well, that it builds its cells in hexagons. The square or triangle would have fulfilled the condition of leaving no interstice, no loss of space between the cells; but neither would have been so well adapted to

the almost circular shape of the insect's body as is the hexagon. My young friends will, of course, suggest that the circular instead of the hexagonal would have been even a better shape for the bee to dwell or move in. Granted; but circles, like octagons and other figures, will not fit each other without loss of space; and there is another, and, no doubt, much more important consideration to the bee: it is, that with the hexagon each component wall or partition answers for two adjoining cells, whereas with the circle or cylinder a whole one would have been required for each tiny animal, and the necessary quantity of wax thereby nearly doubled.

There is, there has long been, a tendency towards generalization in the exact and other sciences, and with more reason now than ever. Two thousand years ago, when Euclid lived, steam and electricity were unknown; pneumatics, optics and chemistry were not practised; photography was not dreamed of. In those days, one could afford to devote years to the sole study of mathematics. We cannot do so now: life is too short, and there are too many things to learn. Imbued it was with this idea that I wrote my treatise of 1866. Nobody, apparently, had dared before me to lay his sacrilegious hands upon the venerable teachings of the prince and patriarch of geometers; neither have I done so; but what I have done (and that I was not far wrong in acting so, will, I think, be admitted) has been to reduce, by more than one-half, the separate and demonstrable propositions of the Greek geometer, while retaining the whole of his conclusions.

The fifth book I have eliminated altogether. I have removed it from the elements, and given all its teachings in my "principles," making axioms of some and corollaries of others of Euclid's propositions; for, I hold that to conceive and admit the truth of an axiom, there takes place within the mind a certain process of reasoning, however short it be. For instance, equal ratios are equal quantities, and quantities which are equal to the same or to equal quantities are equal to each other. It, therefore,

follows, as a mere corollary of this axiom, that "Ratios which are equal to the same or to equal ratios are equal to one another;" hence, I do not see the necessity of making this a demonstrable proposition. Again have I made an axiom of proposition F of Playfair's Euclid, and justifiably so, I take it; for quantities which are made up of the same or of equal quantities are equal to one another; and since ratios are quantities—numerical ones—therefore are "ratios which are composed or made up of the same or equal ratios equal to each other." Of Euclid's 2nd and 3rd propositions, book I., I have made postulates. Of his 22nd I have made my 1st, and thence deduced *his* 1st, as a simple consequence thereof. Why, for instance, make a theorem of the enunciation that two lines parallel to a 3rd are parallel to one another, or that two triangles similar to a third are similar to one another?—for, what constitutes this parallelism of the lines, this similarity of the triangles, but equality of distance in the first and equality of angular space in the second?—hence have I made of the former a corollary to my definition of parallel lines, and of the latter a corollary to my definition of similar figures. Of Euclid's 35th and 36th of the 1st book I have made but one proposition; for Euclid himself, who in his 4th and 8th of the same book places his figures the one upon the other to prove their equality, might in the same way have superposed the equal bases of his parallelograms, so as then to consider them as one and the same base, which would have allowed him to make of the second proposition a mere corollary of the first. Again, with Euclid's two next propositions of the same book, his 37th and 38th, and after his own assertion in his axioms that "things which are halves or doubles of the same thing, or of equal things, are equal," why did he not reduce them to mere corollaries of his 33rd and 34th? I have in the second book added a lemma, which shews how important a proposition is the fifth of that book, and how fruitful in results. I cannot but agree with Clairault in saying that if Euclid considered it necessary to demonstrate such a

self-evident proposition as that a line joining two points in the circumference lies entirely within the circle, it must be because he had to answer and confute the objections of obstinate sophists who made it a point to refuse their assent to the most evident truths; for as well might it be attempted to be proven that the diagonal of a square lies within and not without the figure, or that the centre of a circle is within it. What difference is there between finding the centre of a circle or of a portion only of its circumference? And again, what difference between circumscribing a circle about a triangle and making one pass through three given points? Why, then, did Euclid or his commentators make of these problems as many different propositions, when they really constitute but one and the same operation? A different solution of Euclid's 33rd of the 3rd book allows of reducing its three several cases to one; and so of his 35th and 36th of the same book. Similar processes have been followed out by me in reducing in number the dmeonstrable propositions of the 4th book; and in the 5th, which, as already stated, I have put among the principles, the substitution for "magnitude" of the word "quantity," with its signification defined, to comprise numerical as well as other quantities, has allowed of my reasoning on numbers, and giving, as I have done, the mode of arriving at the numerical and practical solution of the many problems propounded in my work. In Euclid's sixth, why should 14 and 15 be separate theorems, in view of axiom two, which sets forth that what is true of the whole is true of the half? These citations will suffice to give an idea of the process of reduction and generalization followed out by me in the geometry of lines and surfaces; and in the same way have I modified the ordinary demonstrations of solid geometry, and of plane and spherical trigonometry. Nor is my treatise less strictly logical in all its teachings than that of Euclid, every proposition depending for its demonstration or solution on those that came before, and in no way on those that follow.

MENSURATION.

AREAS.

Every triangle, it is evident, is the half, the exact half, of its corresponding parallelogram. Now, the parallelogram is, in area, equal to the rectangle of the same base and altitude; for, if the oblique or triangular portion be cut from one end and added to the other, the figure becomes a rectangle; and as the area of a rectangle is equal to the product of the number of units in its base and altitude, it follows that the area of any triangle is equal to half the product of its length and breadth. This, then, may be adopted as an element into which all plane figures can be divided, and their component areas made up separately and put together. In the case of the regular polygons, the computation of their areas becomes simplified, as they can be divided from the centre into as many equal triangles as there are sides. The area of the trapezium is half the product of its altitude into the sum of its parallel sides.

A sector of a circle is nothing but a triangle of equal altitude throughout, or having a circular base, every point of which is equidistant from the apex; and its area is, therefore, equal to the half-product of its base and altitude; for its arched base may be conceived to be divided into a number of parts, such that each of them shall be, without sensible error, a straight line, and hence the rule; for it is evidently the same thing to compute separately and take the sum of the component triangles of the sector, or to add together their contiguous bases and multiply, once for all, by the altitude or radius. Again, the whole circle is but made up of contiguous sectors or triangles, whence it follows that the area of any circle is equal to the half-product of its circumference and radius. Next, we have to consider among plane figures the segment of a circle, or that which is included between a chord and its corresponding arc; and this is evidently equal to the area of the sector, less the area

of the triangle formed by the chord and radii. Now, the lune, a figure like the new moon, and hence its name, formed of two non-concentric arcs of the same or different radii: the area of this figure is the difference of its two component segments, so that a mere repetition of the process just described will measure its superficies. The zone or portion of a circle between two parallel chords can also be conceived as the difference between two segments, or as made up of a trapezium and two segments, and its area found accordingly. Concentric and eccentric rings are, of course, equal in area to the difference of their component circles. Of the ellipse, the area is equal to the product of its diameters into decimal ·7854; for it is found, in the manner hereinabove set forth, that of a circle whose diameter is one, the area is ·7854: in other words, the area of the circle is about 78½ per cent. of its circumscribing square, so that this area is more quickly arrived at by squaring the diameter and reducing the result in the required ratio; and the ellipse being analogous to the circle, its area is found in a corresponding manner. The area of the parabola, I may add, is just ⅔ of its circumscribing rectangle.

There is a more general mode of arriving at the areas of all plane figures; it is by dividing them into a number of trapeziums by a series of equidistant parallel lines or ordinates, and of multiplying the common breadth or distance between the lines by the sum or combined length of all of them except the first and last, of which one-half only must be taken; and this applies to every imaginable figure, in which, the closer the ordinates, the more accurate, of course, the area. There are some few figures bounded by curvilineal lines, of which it is, nevertheless, easy to compute the areas; for instance, where a convex portion thereof is compensated by a corresponding concavity, as in the developed surfaces of intersecting vaults or arched ceilings, or, on a smaller scale, the developed area of the elbow of a pipe or cylinder of any kind. Finally, there is a mode of measuring the

surfaces of very irregularly-outlined figures by a system of compensating lines which are drawn so as to include such portions of the superficial space outside the figure as may make up for, or be equivalent to, the portions left without the lines.

SOLIDS.

The measurement of solids comprises that of their surfaces as well as that of their volumes or solidities. Solids may be classified as prisms and prismoids, cylinders and cylindroids, pyramids, cones and conoids, spindles, spheres and spheroids. Prisms are solids which have two equal and parallel ends or bases, and of which all the other faces are parallelograms; so that the prism is equal in diameter or breadth throughout its whole extent, and different in this respect from the pyramid or prismoid of which the sides incline or taper towards one end of the figure. A prism may have a triangle for its base or any other figure, and is called, after the nature of such base, triangular, quadrangular, pentagonal, and so forth. The cylinder is nothing but a prism having a circular base or polygon of an infinite number of sides. Among prisms, the parallelopipedon is that of which the opposite faces are parallel, as the name implies, as in the cube; in consequence of which, any side or face of this or similar solids may be assumed as the base. We all know what a pyramid is, and so of a cone, which is only a pyramid with a circular base. A conoid is a species of cone rounded off at the top like a pear, or like the ice-cone at the Montmorency Falls. It may be conceived to be generated or traced out in space by the revolution of a parabola, or other like figure, about its axis; and it goes by the name of the generating curve, as parabolic, hyperbolic conoid. The frustum of a pyramid, cone, or conoid, is that portion of the solid which remains after the apex has been removed; and it is said to be contained between parallel bases when the cutting plane is parallel to that on which the solid stands. All these solids may be right or inclined; and

if so, they require to be so designated, as a right pentagonal prism, an inclined octagonal pyramid, an oblique cone or conoid. The spindle, as its popular name implies, is a well-known form, being circular in its cross-section, and tapering from its centre towards the ends: it may be generated in space by the revolution of an arc of a circle, or of an ellipse, or by a parabola or hyperbola, around a line which is called the axis of the spindle, and, like the conoid, derives its distinctive name from that of the generating curve, as a circular spindle, an elliptic, parabolic or hyperbolic spindle,—not that the spindle itself, as a whole, is a very important solid, but that its middle frustum is the geometrical representation of almost every form of cask, the world over. The sphere, that most beautiful of all solid forms, and which, as I have already stated, contains within itself more space or volume than any other figure of equal superficies; the spheroid or flattened sphere, the figure of this earth of ours, and of the moon, and sun, and planets, which, one and all, are flattened at the poles and protuberant at the equator; and, finally, the prolate, or elongated spheroid, make up the varied classes or families of solids, or space-enclosing figures, with their frustums, segments, ungulas or hoofs, and other sections which the limits of a lecture will not allow me more fully to define.

THE STEREOMETRICAL TABLEAU.

I come now to the more immediate object of this lecture, that which has been, perhaps, to some extent, instrumental in procuring for me the honor of an invitation by the Literary and Historical Society of Quebec to read a paper within the classic precincts of its historic halls; and may I hope I shall have treated the subject in a way to warrant the courtesy and be of some interest to the very numerous and highly appreciative audience, the *élite*, the aristocracy, so to say, of the educated or well-read portion of the community, which has on this evening honored me with its attendance and kind and flattering attention. I allude, of course, to the

Stereometrical Tableau which you see here before you, and of which it behoves me to say something, even at the risk of appearing partial to myself. This *tableau*, or board, which is made up of some 200 models, each of which can be removed and replaced at pleasure, and put into the hands of the pupil for examination, comprises almost all the elementary forms which it is possible to conceive. Among them, those which I have just now enumerated, as prisms and prismoids, cylinders and cylindroids, both right and oblique, and the frusta and ungulae of these bodies; pyramids, cones and conoids, right and oblique with their frusta and ungulae or hoofs; the sphere, with its subdivisions into hemisphere, quarter, half-quarter or tri-rectangular pyramid, segments, zones, frusta and ungulae, and many other sections of this solid; the prolate and oblate spheroid, with their many sections and subdivisions; spindles and their sections, including models of casks of all varieties; the five regular polyhedrons or so-called platonic bodies, though known before the time of Plato: there are also a host of other varied forms, such as convex and concave cones and other solids, and frusta and ungulae of the same; concentric and eccentric rings, and a certain number of compound figures, made up of, or capable of being subdivided into, the elementary solids just enumerated.

My object in the preparation of this *Tableau* has been to generalize and make easy and popular the study of solid forms, and the mode of measuring their surfaces and their solidities or volumes. The lateral faces or sides and the opposite or parallel bases or ends of these solids afford all the plane figures, from the triangle, square, and polygon, to the circle, ellipse, and parabola, etc., with their component sectors, segments, zones, and lunes. Of these you have already learned to estimate the superficies. The models also afford examples of convex superficies, inclusive of the spherical triangle and polygon, the spherical zone and lune and segment, and of all the component parts thereof. The

mode of arriving at the areas of these is to assimilate them to plane figures by a division of the concave or convex surface by equidistant ordinates drawn from the extremity of the fixed axis of the solid, or that around which the generating curve is supposed to have rotated in sweeping out the solid. The distance between the ordinates, each of which, from the description just given, is, of course, a circle or portion of a circle, is made so small as to allow of the intervening arc being considered a straight line or thereabouts. The figures thus traced out upon the solid under consideration are either continuous zones or portions thereof, and are to be considered as trapeziums—the first continuous, the others not so, or only partly so. Now, to get the area of a trapezium, which, as already defined, is a plane figure with two parallel sides,—and these last may, of course, be circular or curved as well as straight,—the half-sum of such sides is multiplied into the perpendicular distance between them, or the height or breadth of the figure; and the same rule applied to the curved area to be computed is stated thus: to the half-sum of the lengths of the end ordinates—that is, of the first and last—add the sum of all the other ordinates or arcs and circles, and multiply the whole by the distance between the ordinates or by the breadth of the component zone. The combined length of the circles or circumferences is easily obtainable from a multiplication of the sum of their diameters by $3\frac{1}{7}$, or, more correctly, 3·1416. This rule, as applied by me (page 669 of my geometry) to a hemisphere of 263 units in diameter, and with only four ordinates or five segments or zones, brings out the result within less than one per cent. of the truth; while with nine ordinates, the result is erroneous to the extent of only the sixth part of one per cent.; and with 19 ordinates, or 20 sections, the $\frac{1}{40}$ of one per cent., or within $\frac{1}{4000}$ of the true content. Not that I insist, however, on this mode of measurement for convex or concave superficies, where there are other rules which, as in the case of the perfect

sphere or spheroid, or segments of those bodies, bring out their curved areas exact; but the great and manifest advantage of this general system is, that its accuracy is independent of the shape of the body to be measured; while, if the rule for a sphere, for instance, were applied to a body not strictly spherical, the result might prove erroneous to a far greater extent than if arrived at by the system of equidistant ordinates,—to say nothing of the great advantage to the practical measurer of having to store his memory with but one general rule applicable to all cases, and this rule the same as that for plane figures, whereby the whole range of areas or superficies, whether plane or convex, becomes submitted to one and the same formula, to wit: a subdivision by equidistant parallel lines into figures, every one of which is a trapezium—whether continuous or non-continuous, it matters not. It now remains to compute the volumes or cubical contents of the solids of the *Tableau*, and, as already stated, they comprise all known elementary forms; and here it is that I lay special claim to the introduction of a system of mensuration which is not approximately accurate as applied to the great majority of geometrical forms, but of which the absolute accuracy is proved and undoubted. The rule is simply what it purports to be, as printed at the top of the *tableau*, *i.e.*: "To the sum of the parallel end areas add four-times the middle area, and multiply the whole by $\frac{1}{6}$ part of the height or length of the solid." The word "*parallel*" is introduced as a reminder that the opposite ends or bases must be contained between parallel planes, or, if not so originally, that they must be made so by subdivision or decomposition of the solid into its constituent elements. The whole difficulty is, therefore, reduced, by my system, to measuring the areas of the opposite bases and middle section, the remainder of the work being a mere multiplication; so that the proposed formula renders this branch of study of such easy and general application that the art or science may now be taught in a few lessons where it formerly required months,

or even years. Take up, for instance, the segment of a conoid or spheroid cut off by a plane inclined in any way to the axis of the solid, a figure such as would be presented by the space occupied by any liquid or fluid substance in a vessel of this shape when inclined to the horizon; look at the preliminary labour required by the old rules of finding out the axis or diameters of the entire solid of which the segment under consideration forms a part, and these factors are necessary as elements in the computation. My system dispenses with all this, and the solid, whatever it may be, is taken hold of and submitted to direct measurement, without in any way inquiring about the size or form of body of which it is a section. But for another reason is this study excluded from general education, because, with ordinary rules, the higher calculus is often indispensable; and as even when it has been taught and learnt, it is as soon forgotten, therefore can these ordinary rules be of little or no use to the practical measurer, even when supplied with all the necessary books and data for working out his problems.

It may be objected that, for the prism and cylinder, for instance, the ordinary rule is even more simple than the prismoidal one. Of course it is; but it flows of itself directly and immediately from the formula. Take up a prism: I have defined it to be of equal breadth throughout; then is its middle section, or any other, when made parallel to the base or end, equal in area to such base; and the argument occurs that six-times this area into one-sixth the altitude reduces to the more simple enunciation of once the area into the whole altitude. Again, in the case of the pyramid or cone, the half-way diameter or breadth is just one-half of what it is at the base; and as the half of one-half, or the product of $\frac{1}{2}\times\frac{1}{2}$, is $\frac{1}{4}$, therefore is the half-way area a quarter of that at the base. The pupil who has already learnt this, sees it at a glance, or recalls it to his memory, and reasons thus: four-times the middle area is equal to the base; and twice the base (for the upper area here is zero)

into $\frac{1}{6}$ the altitude is identical with the ordinary rule of once the base into $\frac{1}{3}$ the altitude, or $\frac{1}{3}$ the product of the base and altitude. There is one more case in which the old or ordinary rule is apparently more simple than the general formula; it is when we have to do with a paraboloid, of which the volume is just one-half of its corresponding cylinder.

But here we have done with the comparative advantages of the old rules, and in all other cases the formula is exceedingly more simple. Take, for instance, the frustum of a pyramid; and, first of all, how know you that it is one, except by measuring its upper and under edges, and comparing their respective lengths to find out—which you must do—that due proportionality exists between them; else is the body not the frustum of a pyramid, and, therefore, not subject to the rule? But, granted even that it is the figure you do take it for, see you the trouble of getting a mean proportional between the areas of its opposite bases, which includes a lengthy multiplication of those areas and a laborious extraction of the square root of the product, which very few persons know how to work out? How much more simple to arrive at the arithmetical mean of the opposite diameters and the middle area therefrom?—and if the figure be the frustum of a cone, the three diameters are squared, the square of the middle one taken four-times, and the whole multiplied together, that is, their sum, by decimal ·7854, and the result by $\frac{1}{6}$ the altitude of the frustum; and as this calculation has to be repeated every day, in all parts of the world, in computing the contents of tubs and vats of all imaginable sorts and sizes, the saving in time and trouble is certainly most worthy of consideration.

But suppose this prism or cylinder, this pyramid or cone, this conoid, or this frustum, to be not truly such a figure; let it differ but ever so slightly from what it should be to enable it to be submitted to ordinary rules,—then, if such rules be made use of in computing its contents, adieu to all accuracy, since the very element by which the body differs

from its geometrical prototype—that is, its intermediate diameter—is not taken the least notice of; while the prismoidal formula, on the contrary, takes in this ever-varying element, this half-way breadth between the top and bottom in a tub or vat, between the bung and head, as in a cask, and gives a result, in 99 cases out of 100, more true than any other system where this important and indispensable element of variation is not attended to. With regard to the sphere or spheroid, each of its opposite bases is a zero of superficies, as a plane can touch either of them only in one point, and the sum of the areas in this case is four-times the middle area. And how correct this is you shall directly see, for, by ordinary rules you are taught to multiply the convex area of the sphere by $\frac{1}{3}$ of the radius; but this convex area is precisely equal to four-times the middle section, or to four great circles of the sphere, and $\frac{1}{3}$ the radius is the same thing as $\frac{1}{6}$ the diameter or altitude,—so that here again, you see, as in the case of the prism or cylinder, the pyramid or cone, the proof direct of the accuracy of the rule. Now, take up a hemisphere: the half-way area is easily shewn to be just $\frac{3}{4}$ of that at the base; and as four-times $\frac{3}{4}$ are three, and 3 and 1 are four, four great circles into $\frac{1}{6}$ the altitude of the half-sphere gives, of course, half the solidity just obtained, or that of the hemisphere under consideration. The same is true of the flattened or of the elongated sphere or spheroid and ellipsoid, and of the half thereof, and whether the cutting plane or base be perpendicular or not to either axis of the solid; and the areas which enter as elements into the computation of the cubical contents are always ellipses, and, what is more, they are similar or proportional ellipses; so that, from knowing any one of the diameters of the middle section, the area can be directly found by rule-of-three, since, as already shewn, the areas of similar figures are proportional to the squares of any of their corresponding dimensions. The exactitude of the formula, as applied to any other segment or zone of a sphere, is fully demonstrated at paragraph 1529 of my Mensuration; its very near approach to truth, in the case

of spindles or their frusta, at paragraphs 1531 and 1574; and its absolute accuracy in the case of any segment of a spheroid, the right or inclined paraboloid, or hyperboloid, at paragraphs 1560 to 1567 of my work.

Now, there may be some curiosity to know how the idea occurred to me of treating every solid as a prismoid by this one and undeviating formula; it is this: taking up the ordinary prismoid, I find its definition to read thus:—"Any "solid having for its opposite bases parallel rectangles; and, "by extension, any solid having for its parallel bases plane "figures with parallel sides." Now, please observe that the only condition expressed or implied in this definition of a prismoid is the parallelism of the sides, and nothing more. Such parallelism does not exclude the proportionality of the sides; therefore is the frustum of a pyramid, to me, a prismoid; and this is what no one before me, that I am aware of, at least, appears to have conceived; for in no treatise have I ever seen the prismoidal formula applied to the frustum of a pyramid or cone. Look, again, at the rectangular prismoid, and as no ratio of the sides is implied, let the ratio be infinite; or, in other words, let one of the parallel sides approach towards the other until they meet and form a single line, or edge, or arris; and then have we the wedge, which is, therefore, another prismoid. Again, let this edge, or line, or arris, become shorter, and still shorter, until it dwindles to a point; and then have we a pyramid, which is also a prismoid, to all intents and purposes. And since a line or edge may become a mere point, so, conversely, may a point become a line, whereby a prismoid, originally square or rectangular, may have one or both of its opposite bases modified into an almost infinite variety of similar or dissimilar figures, as I have shewn at pages 713 to 718 of my treatise; and the more general enunciation is thereafter arrived at, that a prismoid may have for its parallel bases any two figures, whether equal or unequal, similar or dissimilar; any figure and a line parallel to the plane

thereof, as in the wedge; any figure and a point, as in the cone and pyramid; any two lines not parallel, but situated in parallel planes. Other definitions may be given more concise than this, more technical and scientific, as that "the prismoid is swept out in space by the revolution of a straight line around two parallel planes of any form whatever, and irrespective of the relative velocities of the two extremities of the generating line;" but the former gives the best idea of the form of solid, as it defines the figure of its ends or bases.

The *Tableau* you will find upon inspection to offer a variety of forms; for instance, one base a square, the other also a square of greater or less size, but turned diagonally as regards the other, the middle base an octagon. Again have we prismoids or cylindroids of which one base is a circle, the other an ellipse, or two ellipses of equal or different size, the longer diameter of the one corresponding to the shorter diameter of the other, and other forms may be conceived in almost endless variety; and of all, without exception, the formula gives the true cubical contents, each of the models exhibiting at a glance, by means of the pencil-line to be seen upon it, the nature and dimensions of the middle section. A word in relation to the regular polyhedrons which are also among the models on the board. Of these bodies there are but five, strange enough to say; and yet, the conclusion is immediate and inevitable, for it takes at least three planes to make a solid angle; and as the sum of these plane angles must be less than 360°, or four right angles, as otherwise the solid angle would then cease to exist and become a plane surface, it suffices to examine which are the regular polygons, whose angles, taken in threes and fours and fives, etc., make up an angle less than four right angles. The equilateral triangle can be put together in 3's and 4's and 5's, which affords the tetrahedron, octahedron, and icosahedron. It cannot be taken in sixes, as six-times 60° = 360°; and therefore can we have no other regular solid with its faces

equilateral triangles than the three just enumerated. The right angle can be taken in 3's only: two would not enclose a space, and four would form a plane; hence is the perfect cube the only solid that can be formed with square faces. Lastly, the pentagon, of which the angle is 108°, supplies the dodecahedron, or 12-sided figure, the sum of its three plane angles being 324°. The regular hexagon cannot be made to answer, as its angle is 120°, and three of them would make up four right angles, as you see they do when looking at their exquisite arrangement in the beehive, or the not less beautiful symmetry displayed in the nest of the common wasp. *A fortiori*, then, can heptagons or any other polygon not be used to build these solids with; and hence, again, as just stated, can there be but five, and only five, of these platonic forms. As to their mode of measurement, the cube or hexahedron is a mere prism, the tetrahedron a mere pyramid, the octahedron two pyramids base to base, and the two last, the 12 and 20-sided figures, made up of as many pyramids, having their common apex in the centre of the solid or of its imaginary circumscribing sphere, whereby will the computation of one of these component pyramids afford the volume of the whole.

As to the measurement of compound figures like the frustum of a cone or pyramid, or of any other body, between bases that are not parallel, the solid is resolved or decomposed by a section parallel to the base and passing through the lowermost edge of the frustum's upper base into two portions, one of which is a frustum proper, the other a hoof, or ungula, or pyramid, or some other figure, as the case may be. The common buoy is thus resolved into a cone and segment of a sphere; a gun or mortar, the frustum of a cone or cylinder, with a hemisphere or segment of a spheroid; the Turkish or Moorish dome, or pinnacle, or spire, the middle frustum of a sphere or spheroid, surmounted by a hollow or concave cone, and so on. If a spherical cone be proposed, it is evident that it can be conceived and treated under two

aspects—first, as a cone proper, with the addition of a segment of that sphere of which the cone forms part; or (and this applies to any spherical pyramid, or frustum of such pyramid or shell, or hollow sphere, or any portion of a shell,) to the sum of its end-areas, spherical though they be, add four-times the parallel and middle area, and their sum into $\frac{1}{6}$ the altitude will be the true content. Of course, I need hardly remark that in dealing with a hollow sphere or shell, the content is more quickly arrived at by applying the formula direct to and taking the difference of the inner and outer or component spheres.

I have said that the formula applies exactly and demonstrably to the great majority of solids. From this it is, of course, inferred that there are some exceptions, as in the case of hoofs, ungulas and spindles, but in the same way as the cask or middle frustum of a spindle is measured to within almost perfect accuracy—say to within the quarter or $\frac{1}{10}$ or $\frac{1}{20}$ of one per cent., or a half-pint on a hogshead (see pages 707, 708, and 709 of my treatise), by working upon its half, or by taking the bung diameter as that of one of its ends or bases, and for the middle area that which is at its quarter, or half-way between the head and bung,—in the same way, I say, as this is done, so in the hoof and ungula of any solid may almost absolute accuracy be attained by a subdivision of the body into parallel slices, two or three of them generally sufficing, or four or five when the minutest accuracy is insisted on, just as we approach nearer and more near to the circumference of any circle of which the diameter is known, by taking in more decimals. And in the same manner may hollow or concave cones or cylinders, or if they be convex or swollen out, or other bodies be decomposed and measured, which are not true geometrical figures, and thus the one, and only *one*, most simple formula maintained, made use of, and applied in every conceivable case, without the necessity of learning or remembering any other. The subdivisions, the decomposing planes of section,

may be made equidistant, and the grand result thus arrived at, that one universal rule, one formula, will measure all solids and all surfaces; for, though I have not yet alluded to the fact, it is demonstrable—moreover, it is shewn—that when plane figures, surfaces, are cut up by equidistant ordinates, their areas, the area of each of them is equal to the sum of its bases and four-times the middle base or section into $\frac{1}{6}$ the altitude of the figure. Now, if any solid be divided by a series of equidistant planes, and any surface by a similar series of equidistant lines into portions of equal altitude, and if intermediary or half-way sections be conceived in either case, we get the universal formula that their contents, solid or superficial, as the case may be, are equal to the sum of the extreme bases, together with twice the sum of all the other end-bases, and four-times the sum of all the half-way sections into $\frac{1}{6}$ the common altitude; the bases and sections being, of course, superficial or linear, according as the figure is a space-enclosing one, or a mere surface, plane or curved though it be. I have already alluded to the tendency towards generalization in almost everything: in physics and in chemistry are all phenomena submitted, so to say, to some general, some universal law or rule. The mechanical powers may be said to constitute but one, and are, at any rate, similar in this, subjected to this law, that what they give in power they consume in time or space. The one measuring unit, the metre, is forcing its way throughout the world, and in its wake must follow one unit for all surfaces, one for all capacities. So are coin and currency becoming simplified. Complete the scheme, and to the sameness and identity of the unit add one general mode of computation; then will not only the unification of the currency be brought about, as proposed in France, and the project most ably abetted in this Dominion by our fellow-countryman, R. S. M. Bouchette, Esq., but it shall be the more universal scheme, the one grand unification and generalization of all science, one universal language, whereby

nations may commune, converse with one another,—some day, one religion, one shepherd, and one flock,—the millennium, indeed. But do you see the immense advantages of this generalization? See you its untold consequences? Look at the time now necessarily devoted to the mere reduction and translation of all these ever-varying rules and units; they fill a thousand volumes, while the time and trouble devoted to their compilation might be so much more profitably employed, now-a-days, in the study of new sciences and new arts conducive to the greater happiness and welfare of mankind.

Now that we have, so to say, glanced at all the figures on the "*Tableau*," with their more or less regularity of outline, their plane and curved surfaces, the question still arises: "How are irregular bodies of all kinds to be measured, such as statuary, bronzes, carving, and the like?" And that this lecture, so far as the limits of a lecture will allow, may be complete in itself, and go over the whole ground foreshadowed in its title, it behoves me, in a few words, to supply the necessary information. It is very simple, and, in fact, more so, to arrive at the exact cubical contents of a very irregular body than of one of more exact form; for, with the latter an attempt is always made at direct measurement, while with the former a mechanical process is followed, which solves the problem in a manner most expeditious and most satisfactory. Take up a statue or other carved figure, or the capital of an Ionic or Corinthian column, a square or cylindrical vessel capable of containing it. Pour water into this vessel until it reach to above the top of the object to be measured, and mark the height at which the water stands; then remove the object, and again note how high the water stands, when the difference will immediately afford the volume sought. If the substance of the body or of the containing vessel be of an absorbent nature, use sand or some like substance instead of water. There are still other modes of arriving at correct conclusions. The specific gravity of any body is its weight compared with that of water. Suppose, then, that tables

have been prepared wherein the ratio of weight of every substance is given to its equivalent of water, or its absolute weight without regard to the equivalent: take up from off the public highway a shapeless stone, and weigh it; compare its weight by rule-of-three with that of a cubic foot, or inch, or yard of the same substance, and hence do you arrive directly at its cubical contents. Conversely, if the weight be required of some object which cannot be submitted to direct computation by putting in a balance, but if its volume can be arrived at, then also can its weight be ascertained by a simple rule of proportion.

Now, let it be required to find the component quantities of some compound body or amalgam. For instance, you have a mixture of copper and zinc fused together and solidified into one compact body, without a trace of either of the constituents; the weight of each of the respective metals can be submitted to direct calculation, the factors or elements entering into the required formula being merely the specific weight as well of the compound as of each of the ingredients of which it is made up. And so of a mass of quartz and gold; and though little or none of the precious metal may be visible to the eye, the weight of the latter can be arrived at with comparative facility. We are told that Hiero, King of Syracuse, gave to some clever artificer a quantity of gold wherewith to fabricate a crown; but suspecting, when the crown was finished, that the jeweller had purloined a portion of the gold and substituted silver in its stead, he submitted the question to Archimedes to propound. Specific gravities were not then known; but our philosopher, while in his bath, it seems, was cogitating how he might best solve the proposition propounded by the King, when, noticing the difference in weight of his own body when immersed in water to what it was in air, he conceived the happy idea of submitting the crown to a like process of computation, and, after weighing the crown itself in water, and then pure gold and silver, found, by an easy calculation,

that, as the King had rightly guessed, the crown was in reality made up of gold and silver instead of gold alone. So glad was our philosopher of the discovery he had made, that he ran through the streets of the city, crying: "Eureka! Eureka!"—"I have found it; I have found it"

Referring, again, to the "*Tableau*," the word *Stereometrical* would seem to imply that it is intended only or altogether for purposes of mensuration. Such, however, is not the case, as it will immediately be evident that it must also be of great utility in acquiring or imparting a knowledge of the nomenclature of solid forms, an acquaintanceship with their varied shapes and figures, which, without such help, would require a previous familiarity with the principles and teachings of drawing and perspective. To the architect, the engineer, and the builder, the models are suggestive of the forms and relative proportions of blocks of buildings, roofs, domes, piers, and quays; cisterns, reservoirs, and cauldrons; vats, casks, and other vessels of capacity; earthworks of all kinds, comprising railroad and other cuttings and embankments; the shaft of the Greek or Roman column; square and waney timber and saw-logs; the camping-tent; the square or splayed opening of a door or window, or niche or loophole in a wall; the quarter of a sphere or spheroid, the half-segment, the vault or arched ceiling of the apsis of a church or hall; the whole sphere or spheroid, the billiard or the cannon ball; or, on a larger scale, the earth, moon, sun, and planets. The models must also prove of great help in teaching perspective drawing and the geometrical projection of solids on a plane; also, their shades and the shadows they project. Again, the art of geometrical development of surfaces is thereby much facilitated. There is also the polar triangle, and other lines necessary for the study of spherical trigonometry.

Whether my attempt to reduce to one simple and uniform system the present multifold and complex rules for finding the

contents of solids, or the capacity of space-enclosing areas, shall prove successful, time alone can tell; for, though it has the merit of being new, it also has the disadvantages of novelty, as Mr. Scott-Russell said of the ingenious screw-propeller invented some years ago by Commander Ashe, a most worthy ex-president of this Society. The scientific world, as well as the political, has its conservatives. We have not yet well learnt the advantages of decimal arithmetic; nor has the tiresome computation of pounds, shillings and pence been yet abandoned for the more expeditious dollar, where the mere shifting of a point works wonders. It takes much time to work out such a revolution—a generation, so to say; but that I shall not have to wait so long for an interpreter I confidently hope, judging at least from the many flattering testimonials I have already received in relation to the multiplied advantages of my invention or discovery.

The Council of Public Instruction, at its last general meeting, appointed a committee, composed of the Lord Bishop of Quebec, Bishop Langevin, of Rimouski—himself a thorough master of the art,—and Bishop Larocque, of St. Hyacinthe, to report upon the subject; and who, I take it, after having submitted to them the very favourable opinions of so many of our best mathematicians, and of other competent judges, such as D. Wilkie, R. S. M. Bouchette, the professors of the Laval University, High School, Morrin College, and other educational establishments of Canada and elsewhere, can hardly fail to recommend the introduction of the "*Tableau*" into all the schools of this Dominion.

I have but just received a letter from the Minister of Education of New Brunswick, asking me to send a "*Tableau*," with the view, says he, of introducing it into all the schools of that Province. Not, however, that I in any way intend to confine myself to Canada. On the contrary, I have already patented the "*Tableau*" in the United States, where I hope, of course, to introduce it; and Mr. Vannier,

in writing to me from France on the 10th of January last, to advise me of the granting of my letters-patent for that country, adds that MM. Humbert and Noé, the president and secretary of the Society for the Generalization of Education in France, have intimated their intention, at their next general meeting, of having some mark of distinction conferred on me for the benefits which my system is likely to confer on education.

The Honble. Mr. Chauveau, our own worthy Minister of Education, and otherwise well qualified to judge, will make it his duty, so says his letter on the subject, to recommend its adoption in all educational establishments and in every school, so confident he is of its practical utility : " Se fera un devoir d'en recommander l'adoption dans toutes " les maisons d'éducation et dans toutes les écoles, certain " qu'il est de son utilité pratique."

From the Seminary, M. Maingui writes:—" Plus on " étudie, plus on approfondit cette formule du cubage des " corps, plus on est enchanté" (the more one marvels) " de " sa simplicité, de sa clarté, et surtout de sa grande " généralité." Bigelow, M.A., " believing it to be of universal " use, shall heartily lend himself to the introduction of my " system." McQuarrie, B.A., " shall be delighted to see the " old tedious process superseded by a formula so simple and " so exact." D. Wilkie says :—" The rule is precise and " simple, and, being applicable to almost any variety " of solid, will greatly shorten the processes of calculation. " I have," he adds, " proved its accuracy, as applied to " several bodies. The *Tableau*, comprising a great variety " of elementary forms, will serve admirably to educate the " eye, and must greatly facilitate the study of mensuration. " The government would confer a boon on schools of the " middle and higher class by affording access to so " suggestive a collection." Professor Newton, of Yale College, Massachusetts, considers the *Tableau* a very useful

arrangement for shewing the variety and extent of the applications of the formula. The Collège L'Assomption "will adopt my system as part of their course of instruction." Rev. T. Boivin, of St. Hyacinthe, says :—"Votre découverte est "précieuse, et je recommande fortement l'adoption de votre "*tableau*, dont je vous prie de me faire connaitre le "coût probable."

There are others who, irrespective of considerations as to the comparative accuracy of the formula, or of its advantages as applied to mere mensuration, have seen how far the models are more suggestive to the pupil and the teacher than the mere representation thereof on the black-board or on paper, and who, in their written opinions, have alluded especially to this feature of the proposed system. Mr. Joly, President of the Quebec branch of the Montreal School of Arts, in a letter to Mr. Weaver on the subject, and after having himself witnessed it on more than one occasion, says, in his expressive style :—"The difference is enormous." The professors at the Normal School are of the same opinion; and others there are who variously estimate the saving in time, by my system, at from twelve to eighteen months.

The prismoidal formula is not new: it has been long known, and sometimes used to compute the ordinary rectangular prismoid, as well as the familiar forms of railroad and canal cuttings and embankments; but no one seems to have conceived the idea of applying it even to the frustum of a cone or pyramid, to which, I must necessarily infer, it was not known to apply,—else, simple as it is, and so much more simple and direct than Legendre's theorem, it must have found its way ere this into treatises on mensuration and the like. Neither has it ever been employed, that I know of, to compute the segment of a sphere or spheroid, nor to many other well-known forms; so that, in this respect, I may lay claim as if to the discovery, and as well for a large number of other solids to which it never was attempted to

apply it. And even if the idea of so doing has at any time suggested itself to others, as sometimes hinted at, they do not appear to have put it to the test, or to have arrived at any useful conclusion in relation to it, any more than the first man who, on seeing steam issue under pressure from the nozzle of a tea-kettle, conceived the idea that such an agent could be made to work the wonders that we know of; nor was steam ever made available in practice till Watt invented the steam engine, or electricity till Morse put up a telegraph. Granted, however, that this formula was discovered before my time, and that I have merely disengaged it from the dust of years, or re-discovered it, still is there, perhaps, some little merit to be claimed. Adams and Leverrier both own to the discovery of the planet Neptune; and Leibnitz was not robbed of the honor of his integral and differential calculus, though Newton had by several years preceded him in the field by the discovery of "fluxions."

Paper V.—THE ARCHIVES OF CANADA.

By Dr. W. J. ANDERSON, President.

A good deal of interest has been shewn of late on this subject, and some action taken to induce the Government of the Dominion to appoint a Record Commission; but as the part which the Literary and Historical Society of Quebec has always taken in connection with our Archives is not generally known, I have thought well to give a statement, so far as the records of the Society which have escaped the *fires* will enable me.

The charter states that one of the chief objects for which the Society was established was the prosecution of researches into the early history of Canada, and the recovering, procuring and publishing of interesting documents and useful information in connection with the natural, civil, and literary history of British North America. That such was the object of the Government is evidenced by the numerous special grants made to the Society, and which originally formed the basis of the "Historical Document Fund."

The first reference that I can find is in the Report of the Council for 1833, as follows:—"The liberal vote of £200, appropriated the year before last by the House of Assembly, for the purpose of aiding the Society in the research after rare and interesting documents connected with the history of the Canadas, still remains in the bank, at the disposal of the president and committee of Historical Documents, with the exception of about £40, which has been placed in the hands of our zealous and faithful corresponding member, Mr. Gould, of London, to meet any incidental expenses which he may be requested to incur in promoting the objects of the Society."

The next allusion is in the Report for 1837:—"An important addition *to the deposit formerly entrusted to us by*

Lord Aylmer, for the benefit of the public, has been contributed by the *Record Commission*, consisting of thirteen folio volumes and four octavo of that valuable publication." Lord Aylmer succeeded Sir James Kempt, in 1831, as patron of the Society, and perhaps did even more than its first patron, Lord Dalhousie, to advance its interests, by placing in its custody the documents here referred to. The Report for 1837 also says that the efforts of the Historical Document Committee had only been attended with partial success :—" Unforeseen difficulties have hitherto baffled its efforts to obtain information in England, though it has been led to hope that these difficulties may at length be surmounted. Its attempts to obtain information from the *Bureau de la Marine*, in France, have been equally unsuccessful; and the last accounts seem to indicate that the Records from which this information was expected were destroyed in the Revolution of 1789 and '91." The committee, however, had in the press a document communicated by Colonel Christie, illustrating the history of the Province from 1749 to 1760. And it ought to be specially noted that, in addition to other very liberal offers, " another donation of highly interesting works" was made by the Right Honorable Sir Charles Grey.

By the Report for 1833, we learn that the Rev. Mr. Holmes had transmitted from Paris " a large addition of scarce books, both printed and in manuscript." Those printed related to the discovery of the continent, the first colonies, and voyages; and also supplied a want by furnishing the history of Canada from 1750 to 1779. The manuscripts related to the same periods.

In the Report for 1839 the Council congratulates the Society, among other things, on the additions made to the Library " by the splendid donation of the Earl of Durham and the books procured for illustrating the history of the country." The donation was worthy of this munificent patron of the Society, and consisted of *ninety-four* volumes

of the finest and rarest editions of the Greek and Roman classics. There were also procured in London, through the agency of the Honorable A. W. Cochrane, "rare and unique maps and atlases, books of travels, and voyages to America; descriptions of the manners of the nations; the proceedings, wars, and sufferings of the first colonies; and histories of various subsequent periods." The *Councillor Macedo*, Secretary of the Royal Academy of Lisbon, presented a publication of his own, on the navigation of the Atlantic ocean at remote periods. And again, the *Record Commission* of Great Britain and Ireland sent a large contribution of their publications. The Report concludes its reference to the Historical Document Committee as follows:—"The publication of important historical documents has been advantageously continued. By the influence and public spirit of His Excellency the Earl of Durham, some valuable manuscripts have been procured for us from Versailles, which the committee on that subject had in vain striven to obtain through any other channel. The greatest part of them have been printed, and are now ready for distribution. They contain important information relating to the statistics and events of the Province in former periods. The others remain in the Society's archives for future disposal." Four hundred copies of some of the valuable manuscripts transmitted from Paris in the previous year were also printed.

In November, 1839, the Society, by request of the Legislative Assembly, conveyed by its clerk, W. B. Lindsay, Esq., became custodians of the specimens of Natural History belonging to the Province, and was thus enabled to restore and preserve a very valuable collection from the destruction into which it was rapidly falling. The Report for 1840 informs us:—"The Committee on Historical Documents has prepared a second small volume, which is now printed and ready for distribution. It consists of manuscripts presented to the Society by the Earl of Durham and the Rev. Mr. Holmes. They are eight in number, and contain new

and interesting information on the state of Canada under the French Government, which will serve to fill some *lacunæ* in the early history of the Western Provinces.

In 1843 the Council reports, that, as there still remained a balance of the £200 voted by the Legislature in 1832, it had applied a portion of it to reprinting the journals of Jacques Cartier, which had long been out of print, and of which few copies were extant, even in the public libraries of France. The reprint was from a copy obtained by the Society of a manuscript in the Royal Library at Paris, supposed to be a transcript of the original journal of Jacques Cartier himself. It also published a tract relating to the first discoveries on the shores of Canada, from Hakluyt's collection, where alone it was known to be found. The Council also received from a gentleman in Paris a communication, proposing to obtain for the Society copies of documents relating to the early history of Canada, both before and after the period comprised in the works of *Charlevoix*, which are to be found in the archives of the *Bureau de la Marine* and the *Ministère de la Guerre.* Former attempts to obtain access to these having failed, the Council was glad to avail itself of this opportunity, and entered into a correspondence to procure an analysis of the manuscripts and the probable cost of transcribing them, in the hope that the Legislature would be again induced to grant its aid.

The Report of the year 1844 records :—" The Historical Committee have published a pamphlet, being the third of the kind, bearing on the early history of Canada. It comprises the three voyages of *Jacques Cartier*, *Le Routier de Jean Alphonse*, *Voyage du Sieur Roberval*, and *Lettres de Jacques Noël*, with appendices." Copies were sent to the public authorities within the Provinces, and to corresponding literary and scientific associations beyond. The Council also reported that the Historical Document Fund being exhausted, it applied to the Legislature for a new grant, but did not

obtain it, owing to the untimely closing of the session; consequently, it was unable to make arrangements with M. Margry, the gentleman referred to in a previous report.

In the Report for 1845 the Council states that it had renewed its application for a grant to the Legislature, and hoped to be successful, and refers encouragingly to what had been done by the "Historical Society of New York," which, partly by State aid and partly by their own resources, had been enabled to send an agent to Europe, who had been allowed to transcribe from the archives in Paris many volumes illustrating the early history of Canada. From want of funds the Council had not yet been able to employ M. Margry; but he had transmitted a copy of an ancient and interesting plan of Montreal, made in 1729, by *M. Chaussegros de Léry.*

The Report of 1846 says that the Council had laid before the Government an estimate for £1,000, which they proposed to expend in connection with the Historical Document Committee; but the Legislature only granted £200. Finding this sum totally inadequate to carry out its proposed plans, the Council decided to transcribe from the Broadhead collection at Albany; and having obtained permission from the State authorities, by the kind intervention of Mr. Barclay, the British consul, it made a contract with Mr. Félix Glackemeyer to proceed to Albany; and by the end of November, 1845, that gentleman had forwarded to Quebec complete copies of the correspondence between the sovereign and minister of France and the colonial authorities, and also of other interesting public documents, from 1631 to 1684. Mr. Glackemeyer did not expect to complete his work for six months more.

In 1847 we have a most satisfactory account. The Executive had, in compliance with an address of the Legislative Assembly, advanced to the Society £300 to aid in the completion of the service it had so well begun; and

during the ensuing summer Mr. Glackemeyer had furnished *seventeen* folio volumes in manuscript, being copies and extracts from those of Mr. Broadhead, procured by him in Paris and London.

The Society found it expedient to send to Albany the Hon. A. W. Cochrane, a member of the Historical Document Committee, who examined thirty-eight volumes, and marked the portions to be copied. Since then it had received 1,220 pages of manuscript extracted from twenty-six volumes, bringing down the history to 1636. Mr. Glackemeyer hoped, with the aid of his assistant, to have the work completed in a few weeks. The Council acknowledges the courtesy and facilities offered by the State authorities of New York, and its indebtedness to Messrs. *Cochrane* and *Faribault.*

In 1852 the Council availed themselves of M. Faribault's visit to Europe to open communication with several learned societies. The Historical Document Fund was now reduced to £115 4s. 1d.

In 1854 we find :—" The Council have learnt, with the greatest satisfaction, that no less than 600 pages of manuscript documents have lately been received from Paris, containing the official correspondence which took place between the Colonial Government and the Intendants of Canada and the Mother-country, during the period when the colony was under the French dominion. These documents were obtained from the different public archives in Paris by *M. Faribault*, during his mission to Europe in 1851-2. They are a continuation of another series of documents of the same nature, copies of which were obtained in 1845 from the collections made in Paris by Mr. Broadhead, an American agent, bound up in seventeen volumes, and are now on the shelves of our Library. The newly-acquired documents from Paris, now being bound, will form *eleven* large folio volumes ; *and should the Legislature permit these also to be deposited in*

the custody of the Society, they will present a splendid and unique collection of twenty-eight volumes, replete with the most valuable information on the early colonization of the country, the history of the wars with the aborigines, and numerous thrilling events, affording an inexhaustible source of information to the future historian of Canada."

The Council recommended that judicious selections should be made, and a volume printed under the direction of the Society.

Early in the winter of that year, the Society, whose rooms were in the old Parliament buildings, sustained an inestimable loss when the building was consumed by fire. The estimated loss in the Museum and Library was £1,400. Many of the articles and books, being unique, could never be replaced; but, through the great exertions of some members of the Society, almost the whole of the manuscripts were saved.

After this period the Legislature made no special grants to the Historical Document Fund, but increased the annual grant from £50 to £250; and it would appear that the Historical Document Fund, which had been reduced in 1852 to £115 4s. 1d., now stood at £121 8s. 7d.

At the close of the year 1862, the Society, whose Library and Museum had been removed to the rooms in John street, sustained another great loss from fire; but again the manuscripts were preserved, and the Council, in their next year's Report, urged the continued publication, under its control, but on the advice of a sub-committee, who should make the selections. The Historical Document Fund is stated in the general account to be £209 17s. 0d.

I must now turn to Nova Scotia. As early as 1857, the Honorable Joseph Howe, who was always foremost to advance literary research in his native Province, carried a

resolution in the Legislative Assembly to cause the ancient records and documents, illustrative of the history and progress of society in that Province, "to be examined, preserved, and arranged, either for reference or publication," as the Legislature might afterwards determine. By another resolution, in 1859, the Lieutenant-Governor was authorized to procure from the "State-paper office, in England, copies of documents necessary to complete the fyles. And in 1859, he was requested to procure from the Government of Canada, from its archives, copies of papers relating to the early history of Canada.

Dr. Thomas B. Akins was fortunately selected as the paid "Commissioner of Records, and Messrs. S. L. Shannon, J. Bourinot, and A. G. Archibald, a joint committee of the Legislative Council and Assembly to advise with him." The proceedings of Dr. Akins were judicious and successful; and when I visited Halifax, in 1864, I had an opportunity of seeing the result of his labors up to that date, which I found so interesting and important that I felt it my duty, on my return to Quebec, to report to the Council what I had seen; but nothing was done till the 10th January, 1866, when the Librarian, Mr. LeMoine, read in his official report, at the annual meeting:—"The undersigned begs to call the attention of the Society to the fact that several important documents for the history of Canada, according to the statement of Dr. Anderson, exist in the archives at Halifax." At a subsequent meeting of the Council the necessary sum was voted to enable me to procure copies of the papers I might think most suitable. I at once entered into correspondence with the Hon. A. G. Archibald and Chief-Justice Sir Wm. Young, who both shewed readiness to meet my views; and after communication with Dr. Akins, I was informed by Mr. Archibald that if the Society could wait till the end of the year it would be unnecessary for it to incur any expense, as Dr. Akins had in the press, under the authority

of the Nova-Scotia Government, a volume which would contain all the papers I wished, and that he would request Dr. Akins to forward us the work when published. In due time the promised volume came, and proved to be a most careful selection from 200 volumes, which Dr. Akins had arranged and caused to be bound. Its importance may be estimated from the fact that it contained all the missing documents in connection with the most lamentable epoch in the history of Nova Scotia, the deportation of the Acadians,—documents which the Nova-Scotian historian, Halliburton, failing to find among the archives, after a careful search, had concluded *destroyed*, because the Government *were ashamed*, as they well might, of the whole transaction. These documents, however, go to shew that, however much humanity may regret so extreme a measure, there really was no alternative left unless Britain decided to abandon the country to the Acadians.

I must acknowledge that since I have had the pleasure to correspond with Dr. Akins, I have received from him very valuable information in connection with my own historical pursuits, and that the Society is indirectly indebted to his suggestion for the interesting "*Journal of the Siege*," by General Murray, which I had the good fortune to procure from the Record-office at London, without any cost to the Society, through the courtesy of Sir Thomas Hardy and Mr. Kingston, and the kind agency of my friend Mr. Ralph Heap.

I now return to Quebec and our Society. Though no specific grant had been made to the "Historical Document Fund" by the Legislature since its vote of £300 in 1847, still, the Society justly thought that the increase of the annual vote from £50 to £250 was intended to subserve the same object; and, accordingly, it continued the publication of those documents which the Historical Committee thought most desirable, and was thus enabled to place before the public, in 1866, a r[illegible]e containing seven original and

independent papers, bearing on Wolfe's expedition in 1759, operations in 1760, and the American invasion of 1775, which have proved of such interest to the antiquarian and historian, that they have, either individually or as a volume, been eagerly sought after by societies and writers of note on this continent and in Europe.

The next circumstance, and one which gave an important impetus to the subject, was the reading of a paper, before the Society, on "Archives," by Dr. Miles, of the Education Department. After the publication of this paper in our "Transactions," I forwarded a copy to my friend the Honble. Joseph Howe, and pressed upon him the appointment of a commission for Canada similar to what he had been instrumental in establishing in Nova Scotia. As it is in reference to a public matter, and expresses the views of a statesman very experienced in such matters, I shall take the liberty of giving an extract from his letter:

"The Dominion has lasted but four years. Its records are so few and recent that their preservation would hardly afford work for a commission. The muniments of the old Provinces of Ontario and Quebec, I have no doubt, are in a bad state enough. But these are being handed over to each Province, and will be hereafter in the care and disposition of the Local Governments. We sent recently to Quebec ten or a dozen boxes containing some tons of old papers. You had better ascertain from Mr. Chauveau if it is intended to do anything with them."

Though this communication was rather discouraging, I certainly should have adopted its suggestion, and sought an interview with Mr. Chauveau; but, unhappily, at its date, 17th Dec., 1870, Mr. Chauveau was in deep family affliction, and I could not justify myself were I to intrude upon him. Accordingly, I took no further step at that time. Dr. Miles, however, did not rest with the mere reading and printing of his paper, but followed it by the drawing-up of a petition

to the Legislature, in which all the advantages of the appointing a commission were fully disclosed. The Doctor took much trouble in procuring signatures in Quebec, Montreal, and elsewhere. He then proceeded to Ottawa, and secured the aid of Sir Alexander T. Galt, who entered, as anybody who knows him would expect, very warmly into the movement, and, himself, submitted it in a very able speech to the House of Commons, by whom it was referred to the Library Committee, who reported it favorably; but, as it involved a money vote, recommended that the matter should be left in the hands of some member of the Government, and, unfortunately, named Mr. Dunkin, who was peculiarly fitted by his literary tastes and the energy which he always brought to bear on anything he undertook, but who, unfortunately, at that time, was overwhelmed with the labours of the census, and who shortly afterwards retired from office to the bench. It is not known, but it is very probable that nothing has been done since it was referred to Mr. Dunkin.

To shew the importance attached to our archives by foreign historians, I may mention that in January, 1870, I received a letter from Mr. Parkman, who, though a foreigner, is really entitled to be considered one of the first of Canadian historians. I give an extract from this letter:

"Now, there are among your collections the four remaining volumes of the manuscripts collected by *M. Papineau*. The first of these four volumes contains the "*Relation de ce qui s'est passé en Canada au sujet de la guerre tant des Anglais que des Iroquois, depuis l'année* 1682." This seems to be an important document. Is there any prospect of its speedy publication? If not, can I be allowed to have it copied? These four volumes formed a part of the *Papineau* collection, nine or ten volumes in all, of which all the others were burned in the fire of 1849. Does any record remain of the contents of the five or six volumes destroyed? If so, the lost papers could be recopied in France, if Prussian bombs spare the archives. Will you please inform me if any such record is known to exist?"

Failing to get the desired information in Quebec, at the suggestion of a gentleman here, to whom I had applied, I addressed *M. Papineau himself*, and received the following most courteous reply:

"MONTREAL, 21st Feby, 1871.

"*W. J. Anderson, Esq.*:—DEAR SIR,—I had the pleasure of receiving, yesterday, your letter dated 18th inst., with your invoice of a copy of the last year's *Transactions* of the Literary and Historical Society of Quebec, for both of which I return my most sincere thanks.

"I regret much that it is not likely that it may be in my power to help you in the recovery of the manuscripts which the Society lost by fire in 1849. The original, or rather first copies from Paris, had been received by the Parliamentary Library. Were these deposited in your custody, or only copies? The learned librarians at Ottawa are the last source of information to obtain the dates and titles of all that had been received. I am here during the winter months without my library, which remains in my summer residence, *Monte-Bello*, where I usually return with the opening of the navigation—end of April. Very likely the titles and dates of those several writings are printed in the general catalogue of the Parliamentary Library, and the names of the gentlemen by whom I had them copied. These volumes are on the shelves of my library, as they are on yours, but cannot *seriatim* be absorbed in my poor old memory. If, after I shall have reached my home, it were in my power to scrape out of my notes any particulars that could in any way help you as to the best means of reaching the French colonial archives, to have the missing manuscripts copied anew, be assured that I shall not fail to regard it as both a duty and a pleasure to impart the information to you. I remain very respectfully, "J. PAPINEAU."

Having received no further communication from this great and good man, I conclude that he had failed to find anything among his notes that would serve us. Death has completely closed this source of information. I may say that the *Papineau* collection formed part of the "deposit" intrusted to us by Lord Aylmer, and that six out of the ten volumes were consumed by the fire of 1849. I have the pleasure to say

that within the past few weeks the Society was able to forward to Mr. Parkman a printed copy of the manuscript which he had sought, and trust that during the present year one or more of the remaining volumes will be added to our publications.

Mr. Parkman having had occasion, during the past summer, to visit Quebec, for the purpose of consulting some documents in possession of the Laval University, Mr. LeMoine (then President of our Society) and myself availed ourselves of the opportunity, and had conversation with him on the subject of our archives. On his way home, he had the kindness to address to Mr. LeMoine, from Portland, a letter which the Society immediately adopted, as shewing a most intimate acquaintance with the subject in every aspect; and a numerously-attended meeting, on the 11th of October last, passed unanimously the following resolution :

"That the *Literary and Historical Society* of Quebec has noticed with much satisfaction the action taken by the Dominion Parliament, at the instance of Sir A. T. Galt, K.C.B., on the petition presented by the Society and others, praying that measures be adopted to preserve the historical and public archives of the Dominion, by the creation of an office of Public Records; and this Society earnestly hopes that the deep interest recently manifested for the cause of Canadian history by the eminent historian Francis Parkman, as evidenced in his eloquent letter, addressed to the President of this institution, will tend to promote such a useful and national project as the one herein alluded to. That a copy of this resolution be transmitted to the Hon. C. Dunkin, to whose department this subject was referred by a Committee of the House of Commons."

The interest which Mr. Parkman has shewn did not rest here; for, in reply to a letter lately addressed to him by M. Barthe, of Quebec, he gives such valuable information that I take the liberty of publishing it :

"The two volumes of (ıents possessed by the *Literary and Historical Society of* (the ten volumes collected by

M. Papineau. Of these, six were destroyed in the burning of the Parliament House. M. Papineau retained no list of their contents, which, judging from those remaining, were very valuable. They are not included in any other collection in this country, unless brought over by individuals for private purposes, which is not probable.

"M. Margry's list, which I have seen, is an excellent guide, *so far as it goes*, and all the papers named by it ought to be secured without delay; *but it is not complete.* M. Margry omitted many important papers, because they related to subjects on which he himself was making collections. I have seen his documents, which are very voluminous and important. The only way to supply the deficiency is to make a systematic search in the *Archives de la Marine, Archives de la Guerre, Ecole de Chartres, Dépôt des Cartes de la Marine* (whose documents are also kept), and other great repositories, beginning with the year 1663 and ending with the cession.

"The great collection of L'Abbé Faillon, Séminaire de St. Sulpice, Paris, is extremely rich; and perhaps access might be had to it.

"I am unable to give lists of deficient documents, though it is certain that many such exist. A selection from Faillon's papers would certainly be of the greatest value; and those named by M. Margry (in his list at Ottawa) should be recovered before another revolution at Paris. These, with the joint lists of the documents at Ottawa and Albany as a guide, should be made through the archives to complete the collection and supply its vacancies.

"Possibly there may be in the *State House* at Boston a few papers on Acadia, not to be found at Ottawa. I have, myself, a large collection on Acadia, which I shall be happy to submit to examination."

I have received from Mr. Thos. H. Wynne, of Richmond, Virginia, a letter under date of 7th Feby. last, in which he incidentally mentions:—"I enclose a copy of a bill which I introduced in this House (the Senate), and which has passed both Houses without amendment. An index similar to the *Calendar of State Papers*, issued from the Public

Record Office of Great Britain, I shall send your Society a copy of as soon as printed. Up to 1865 these papers were much larger in bulk than they now are, and, of course, more valuable; but when the Federal soldiers occupied our capital buildings at the capture of Richmond, the autograph and curiosity-hunters revelled in the spoils. We hope, however, to present a goodly treat in what we have left."

I annex the bill, as its provisions seem quite applicable to the Dominion. I am far from underrating the foreign sources referred to; but I am stongly under the impression that our first efforts should be directed to making arrangements for collecting together, assorting, and indexing the very valuable documents which we already possess, but which are unavailable, from being scattered from one end of the Dominion to the other. I find, from conversations I have had with several influential French Canadians, that though there is undoubtedly some difference of opinion as to the best mode of procedure, there is perfect unanimity as to the desirability of some steps being taken, if only to preserve from further decay muniments which have been impaired in value and damaged by time and neglect. I trust, then, that a united effort will be made at the next session of the Dominion Legislature. In the meantime, I submit this statement, as few seem to be aware how much has been done in the past in this direction.

QUEBEC, *February* 14*th*, 1872.

SENATE BILL No. 8.

A Bill *to Secure the Preservation of Historical Papers in the Capitol Building.*

Whereas there are in the stock-rooms and lofts of the State library large numbers of manuscripts and other documents relating to the history of Virginia, which have been already greatly impaired in value and damaged by time, neglect, and spoliation:

1. Be it enacted by the general assembly, That Dr. William P. Palmer be and he is hereby appointed to take charge of the manuscripts in the State library, under the direction of the librarian; to assort, index, and prepare the same for preservation in such form as to them may seem best, with authority to publish such of the same as the executive committee of the Virginia Historical Society may select, in such form as may be suitable, from copies taken by them, or under their direction.

2. That, for the purposes of this act, a sum not exceeding one thousand dollars is hereby appropriated out of any money in the treasury, not otherwise appropriated; and the auditor of public accounts is hereby authorized to issue his warrant upon the treasurer for the sum thus appropriated, upon the certificate of the State Librarian, countersigned by the Governor.

3. This act shall be in force from its passage.

APPENDIX.

LITERARY AND HISTORICAL SOCIETY OF QUEBEC.

REPORT OF THE COUNCIL,

FOR THE

YEAR ENDING DECEMBER 31ST, 1871.

THE period has come for the Council to lay before the Society an account of their stewardship.

An uninterrupted and increasing prosperity has marked the past year.

The Stated Meetings have been numerous, and have furnished occasions for treating many subjects of paramount interest. Seven of the papers read have been included in the "*Transactions.*"

The Board has been enabled to carry out a long-deferred determination, and now announces, with pleasure, the completion and publication of a carefully-classified Catalogue of the contents of the Library.

Whilst adding to the collection of works several of the most valuable volumes of the day, this Council has not lost sight of one of the chief objects of its charter—the publication of Historical documents calculated to further Canadian History. Two important MSS. have recently been printed under the auspices of the Society. The first is the Journal kept by General James Murray of the war operations in Canada in 1760. This document was procured from the London Archives through the exertions of Dr. W. J. Anderson, Vice-President. The second relates to the early history of the Colony, from 1682 to 1712—a French MS. of 82 pages, selected amongst our own archives, and recommended by the historian Frs. Parkman, and published under the supervision of the President. These two volumes—a

not inconsiderable addition to Canadian History—bring up to twelve* the number of MSS. published by the Society since 1866.

The department of Numismatics has not been overlooked: in addition to a large number of old and rare coins, the Council calls attention to the collection of beautifully-executed United States medals recently purchased.

Our Museum of Canadian Birds is rapidly increasing, especially by gifts; and with a moderate annual appropriation it will soon attain large dimensions.

The Council is also happy to state that the hopes expressed by the President at the beginning of the year, touching a collection of Canadian Woods, are in a fair way to be realized. For the Woods of Commerce, 60 in number, the Society is indebted to the Provincial Government. A selection of Canadian and Foreign Woods has also been presented by Dr. H. H. Miles, D.C.L., LL.D., one of the members; and so soon as the Society will be prepared to furnish a suitable *locale* for the reception of the same, Dr. Miles has signified his intention of presenting numerous designs of art and manufacture calculated to enlarge the sphere of usefulness of this institution. This naturally forces on our view a topic more than once canvassed of late—the insufficiency of room and accommodation for our ever-increasing Library and Museum.

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* The following is a list of the titles of the Manuscripts of the early History of Canada published under the auspices of the Society since 1866, viz.:

"Campaign of Louisbourg, 1750-58."—By Chevalier Johnstone.

"Journal of the Expedition up the River St. Lawrence, 1759."—From the "New York Mercury," December, 1759.

"Colonel Malcolm Fraser's Journal of the Siege, 1759."

"Journal du Siège de Québec en 1759."—M. Jean Claude Panet.

"Dialogues of the Dead: Montcalm and Wolfe."—Chevalier Johnstone.

"Campaign of 1760 in Canada."—Chevalier Johnstone.

"Invasion of Canada, 1775."—Lieutenant-Colonel Caldwell.

"Histoire du Montréal."

"Voyage D'Iberville."

"L'Armée Américaine, lors de l'Invasion du Canada en 1775-6."—Par J. B. Badeaux.

"Journal of the Siege of Quebec, from September 18th, 1759, to May 25th, 1760."—By General James Murray.

"Recueil de ce qui s'est passé en Canada au sujet de la Guerre, tant des Anglais que des Iroquois, depuis l'année 1682 jusqu'en 1712."

There is a subject, within the scope of this Society, which, during the past year, has attracted much attention amongst its members—the urgency of a Government Office of Historical Records. This matter having been taken up by the Government, all that remained to this Society to do was to watch their proceedings, and to add their own to the many and earnest representations made on this head by all the friends of Canadian History. Our "*Transactions*" contain, on this point, an able address of Dr. Miles, and an eloquent letter from Mr. Parkman, the gifted historian.

The number of Associate Members has now attained the unprecedented figure of 268, and at every meeting new members are seeking election.

The arrangement entered into with Mr. Geo. Mathison as the custodian of the Rooms, Assistant-Secretary, and Sub-librarian, continues in force, as well as the lease with the Morrin College.

J. M. LEMOINE,

Quebec, January 10th, 1872. *President.*

PAPERS READ BEFORE THE SOCIETY.

1871.—February 15th.—Rev. J. H. Johnston:—On "Education, Practical and National."

" March 1st.—Commander Ashe:—On "The Moral and Political Position of Woman."

" March 15th.—Lieutenant Riddell, 60th Royal Rifles:—On "The Red River Expedition of 1870."

" March 22nd.—Monsieur Napoléon Legendre:—"La Mission du Journalist en Canada."

" March 29th.—The Bishop of Quebec:—On "Recreations in History."

" April 12th.—Colonel Martindale, R.E.:—On "Engineering and Engineers."

" April 26th.—Chevalier E. Lef. de Bellefeuille:—On "The Ruins of Baalbeck."

" May 17th.—Major Robertson, 60th Royal Rifles:—On "Southern Africa and the Kaffirs."

" November 29th.—Colonel Martindale, R. E.:—"An Hour with Shakespeare."

" December 13th.—J. Douglas, Jr., Esq.:—On "The Silver Mines of Chili."

" December 20th.—Professor L. Turcotte:—"La Science Historique."

THE PUBLIC ARCHIVES OF CANADA.

MR. PARKMAN'S LETTER.

"PORTLAND, 22*nd June*, 1871.

"J. M. LEMOINE, *Esq., President of the Quebec Literary and Historical Society, Quebec:*

"MY DEAR SIR,—Having been occupied at intervals for many years in researches connected with the early history of Canada, and being, perhaps, as conversant as anybody with the difficulties that beset the investigation, I beg to call your attention to the importance of some combined action to accomplish a task to which individual effort is unequal; without this, Canadian history cannot be well written.

"The materials of your singularly interesting annals are scattered through various archives and libraries in Europe and on this continent. They are often in confusion—what is valuable and what is worthless being mixed pell-mell; the hand-writing is often half legible. These papers, or a judicious selection from them, copied in a legible hand, bound in chronological order, and preserved in a place of deposit, where they could be consulted by the student, under proper restrictions, would throw a flood of new light on Canadian history.

"An excellent beginning has already been made, in the second and third series of Paris documents now deposited in the Library at Ottawa. These, together with the first series, consisting of copies of the French documents of the Brodhead collection of New-York, are invaluable as far as they go. They are, however, an imperfect and partial collection. A heap of French documents, from about the year 1732-4 to the year 1763, a most interesting period of your history, remains uncopied in the archives of Paris, subject to the accidents of revolution, from which, last spring, they narrowly escaped. Their loss would leave a gap which could never be filled. Besides these, there are many documents of an earlier period, which have never been brought to America.

"Strange as it may seem, the States of New-York and Massachusetts began the work of collecting the materials of Canadian history from the archives of Paris and London. Mr. Brodhead, under a State commission,

labored to collect all the French-Canadian papers which had a bearing, direct or indirect, on the history of New-York; Mr. Poore was employed to the same effect on the part of Massachusetts; and the results in both cases have been very valuable. It cannot be supposed that the New Dominion will leave in a state of half-completion a task in which she has so deep an interest.

"I hope that the ardent interest which I have always taken in the history of your country will be a sufficient apology for suggestions which might otherwise seem intrusive.

"With great regard, yours very truly, (Signed,) F. PARKMAN."

At a numerously-attended meeting of the members of the *Literary and Historical Society of Quebec*, held on the 11th of October instant, the following resolution was unanimously adopted:

"Moved by Hy. S. Scott, Esq., and seconded by W. Marsden, Esq., M.D., Vice-Presidents:

"That the *Literary and Historical Society of Quebec* have noticed with much satisfaction the action taken by the Dominion Parliament, at the instance of Sir A. T. Galt, K.C.B., on the Petition presented by the Society and others, praying that measures be adopted to preserve the Historical and Public Archives of the Dominion by the creation of an Office of Public Records; and this Society earnestly hopes that the deep interest recently manifested for the cause of Canadian history by the eminent historian Francis Parkman, as evidenced in his eloquent letter addressed to the President of this Institution, will also tend to promote such a useful and national project as the one herein alluded to.

"That a copy of this Resolution be transmitted to the Hon. C. Dunkin, Minister of Agriculture and Statistics, to whose Department this subject was referred by a Committee of the House of Commons.

"(Signed,) J. M. LEMOINE, *President.*

" WM. HOSSACK, *Secretary.*

"Quebec, October 11th, 1871."

Literary and Historical Society of Quebec.

REPORT OF THE ACTING LIBRARIAN,

FOR THE

YEAR ENDING DECEMBER 31ST, 1871.

At the last annual meeting, Mr. James Douglas was elected Librarian, the Society being aware that he intended to be some time absent from the Dominion. Dr. Anderson undertook to discharge the duties of the office during the absence of Mr. Douglas, which was unexpectedly protracted till near the close of the year: it has, therefore, devolved on the Acting Librarian to prepare the Report.

At the annual meeting in January, 1869, Mr. Faucher de St. Maurice was elected Librarian, and received instructions from the Council to prepare a Catalogue of the Library for printing. Business called Mr. Faucher to Paris; and the Council, being unwilling to delay, requested Mr. LeMoine and Dr. Anderson to make the required arrangements. Accordingly, they secured the services of a French gentleman, a M. Maire, who at once set to work, and faithfully and diligently prepared the manuscript to the best of his ability. On the return of Mr. Faucher, it was placed in his hands for printing; but, from unavoidable causes, no steps were taken till Mr. Faucher's retirement from office.

At the commencement of the present year, Mr. Faucher, at the request of Dr. Anderson, then Acting Librarian, furnished the manuscript to the printers as they required it, when it was discovered that, from Mr. Maire's very imperfect knowledge of the English language and his peculiar style of writing, the printers had the greatest difficulty in deciphering it. The

labour, till they became somewhat familiar with the manuscript, was at least doubled, as was also that of the Acting Librarian in correcting the proofs. In the month of November, during Dr. Anderson's absence, the proofs were read by Messrs. LeMoine and Faucher. When the printing was approaching completion, it was discovered that the index had been mislaid or lost. A remedy, however, was at once supplied by Mr. Faucher, who undertook to prepare a new one; and the Acting Librarian has now the satisfaction of reporting, that, after so many annoying delays, the Society will in a short time be in possession of a very complete Catalogue.

During the past year, many and valuable additions have been made to the Library, both by purchase and donations. Among the donations, is a series of Ordnance Maps and Surveys, presented by Colonel Hamilton, Royal Engineers, Commandant.

The Library has been well frequented, and a very large number of books, on every subject, was taken home for family use; but on looking over the Librarian's Register, it will be found that those most in demand were of the lighter literature, particularly the bound serials; and this leads the Acting Librarian to remark, that while he would be sorry to diminish in any way the purchase of those works of science and art to which the Council has hitherto paid much attention, and which add so much to the value of the Library, he would strongly recommend the introduction of the standard works of the great authors, including those of Scott, Bulwer, James Dickens, Trollope, Kingsley, and D'Israeli,—library editions of which are now published at a cheap rate. He would urge on the Council the immediate appropriation of $100 towards this object.

About one hundred and fifty copies of our "*Transactions*" have been mailed to corresponding societies and gentlemen who have in various ways placed the Society under obligation. On the other hand, many valuable publications have been received in return, which will be found on the Library table. It is to be regretted that we were unable to meet numerous applications, owing to all the publications sought having been burnt in the disastrous fires which consumed our Library.

A very fine Barometer, procured through the agency of Captain Ashe, is now in the Library, and it [illegible] on is every day noted by Mr.

Mathison. In mentioning Mr. Mathison's name, the Acting Librarian takes the opportunity of certifying to his thorough efficiency, and trusts that the Council will this year continue the *bonus* which they voted to him last year.

The Acting Librarian, with the sanction of the Council, caused many of the books, which had fallen into a state of dilapidation, to be repaired, which was done at a comparatively small cost, but has added much to the appearance of the books on the shelves and to their actual value. He recommends that his successor be authorized to continue this work.

He would fail in his duty if he did not point out to the notice of the Society that certain parties, in defiance of the rules of the Library, have been in the habit of handing books which they have taken out, to other members, instead of returning them to the Librarian, which leads to much confusion in the Register, and is unjust to other members whose names have been entered for the books, and who are entitled to them in the order of rotation. Another crying evil, and one to which a remedy must be applied, is the practice, by some members, of retaining, from carelessness or otherwise, the books they have taken out, for a period long exceeding the regulations; and this is too often the case in reference to the newest books, which, of course, are most sought after.

The question of greater accommodation for the Library has been more than once under consideration by the Council; and during the past year, negociations of an informal character have been carried on between Dr. Cook, Principal of Morrin College, and several members of the Council. Though nothing has as yet sprung from these negociations, it is gratifiying to know that all the propositions of Dr. Cook were of the most liberal and friendly character. The Acting Librarian recommends that the Council should, without delay, appoint a Committee to deal with the matter.

WM. JAS. ANDERSON,

Acting Librarian.

LIBRARY, LITERARY AND HISTORICAL SOCIETY,

Quebec, Jan. 10th, 1872.

DONATIONS TO THE LIBRARY.

By M. S tevenson :—History of China, 1665.

By the Dominion Government :—Sessional Papers, 3 to 5, No. 2, volume 3, 1870.

By ditto :—Sessional Papers, 32 to 87, No. 6, volume 3, 1870.

By Mr. Harington :—An Ancient Document of 1776.

By Wm. Himsworth :—An Ancient Document of 1793.

By Dr. W. J. Anderson :—Report of the Select Committee of the Senate on Rupert's Land, Red River, and North West Territory.

By L. Bertolotto :—Scientific American, 1870.

By Dr. W. J. Anderson :—Report of the Postmaster-General for 1870.

By the Crown Lands Department :—Report of the Commissioner of Crown Lands of the Province of Quebec, 1870.

By Dr. W. J. Anderson :—Report of the Waverley Gold Diggings; also, a Report of the Sherbrooke Gold Diggings.

By H. S. Scott :—Returns of the Withdrawal of the Troops, &c., &c.

By Dr. T. B. Akin :—Remarks on the Geology and Mineralogy of Nova Scotia, 1 volume.

By Peabody Academy :—Memoirs of the Peabody Academy of Science.

By L. A. Huguet Latour :—Annuaire de Ville-Marie.

By Boston Society of Natural History :—Historical Notes of the Earthquakes of New England.

By Colonel Rhodes :—The Thirteenth Annual Report of the Board of Commissioners of Central Park, New York.

By Colonel Martindale :—Plan of the Central Hall of Arts and Sciences.

By J. O'Farrell :—Twenty volumes, French and English, various sizes.

By Revd. O. Brunet :—"Eléments de Botanique et de Physiologie Végétale."

[illegible]to :—Catal[illegible]gétaux du Canada.

By Department of Agriculture and Public Works :—Reports of Commissioners for 1868, 1869, and 1870, six vols., French and English.

By Provincial Legislature :—Statutes of Quebec, 34 Vic., 1870.

By W. W. Walkem :—"Dialing," by Wm. Leyburn, London, 1682.

By Dominion Government :—Sessional Papers, 12, vol. 4, No. 1, 1871; Statutes of Canada, 34 Vic., 1871; Sessional Papers, 3 to 4, Vol. 4, No. 2, 1871.

By Provincial Government of Quebec :—Statutes of Quebec, 34 Vic., 1870.

By T. H. Grant :—Map of Inland Navigation (Canada).

By J. Ross :—Homer's Illiad.

By Dominion Government :—Journals of the House of Commons, Canada, vol. 4, 1871.

By Connecticut Academy of Arts and Science :—Vol. 1, Part 2, of their Transactions—1867 to 1871.

By Dominion Government :—Sessional Papers, 7 to 19, vol. 4, 1871.

By W. W. Walkem :—Monogram—Mémoires Militaires sur les Grecs et les Romains, vol. 12.

By A. Mingeaud :—A Condensed History of Paris (dedicated to the President of the Society).

By Dominion Government :—Sessional Papers, 47 to 68, vol. 4, No. 6, 1871.

By J. C. Bushnel, through the Revd. Mr. Bois :—American Tokens, Medals or Medalets, and a few Catalogues of Coin sales.

By J. Ross :—Monthly Review, a Literary Journal—London, 1777—volumes 57, 58, 59, 60, 62, 63, 64, 65, 66, 67, 68, 69, 72, 73.

By do.—The New Annual Register, or General Repository of History, Politics, and Literature, for the year 1782—London, 1783.

By do.—Census of the Canadas, 1851-2, 2 vols.

By J. H. Richardson :—Canadian Arithmetic, 1 vol.

By Rev. Messrs. Laverdière and Casgrain, and L. Brousseau :—Le Journal des Jésuites, par MM. les Abbés Laverdière and Casgrain—Quebec, 1871.

By Dr. W. J. Anderson :—The Calendar of King's College, Windsor, Nova Scotia, for 1871-72.

By Dr. T. S. Hunt :—Report on the Chemistry of the Earth, by T. S. Hunt, LL.D., F.R.S.—Washington, 1871.

By do.—Address to the American Association for the Advancement of Science, by T. S. Hunt—Salem, 1871.

By do.—Geological Survey of Canada—The Fossil Plants of the Devonian and Upper Silurian Formations of Canada, by J. W. Dawson, Esq., LL.D., F.R.S., F.G.S.—Montreal, 1871.

By do.—Geological Survey of Canada—Report of Progress from 1866 to 1869—Montreal, 1870.

By Jas. Douglas, Jr. :—Dr. R. A. Philippi—Viage al Desierto de Stacama, 1860.

By Dr. W. J. Anderson :—Tables of the Trade and Navigation of the Dominion of Canada, 1870.

By do.—Public Accounts of the Dominion of Canada, 1870.

By Jas. Ross :—Mrs. Jamieson's Love of the Poets, 1 volume.

By L. P. Turcotte :—Le Canada sous l'Union, 1 volume.

By H. S. Scott :—3 volumes—Dominion Government Reports, &c.

By Fennings Taylor :—Canadian Biography—The Three Last Bishops appointed by the Crown for the Anglican Church of Canada.

Literary and Historical Society of Quebec.

REPORT OF THE CURATOR OF THE MUSEUM,

FOR THE

YEAR ENDING DECEMBER 31ST, 1871.

The undersigned, in rendering an account of his trust, has the pleasure to mention that real progress has been accomplished in the Department of Natural History during the last twelve months. Several important additions were made in different sections, and even new ones have been created. But before enumerating any of those acquisitions, the undersigned deems it a part of his duty to state that, under the enlightened guidance of the President of this Society, the Curator of the Museum found his task comparatively easy; in fact, he found he could not do better than complete the measures suggested by his laborious predecessor, J. M. LeMoine, Esquire.

The first important addition made was a collection of South-American birds' skins, procured in August last. They have since been mounted in good style by a professional taxidermist of this city, and are now exhibited in a separate glass case.

The munificence of Mrs. James Gibb is also a most pleasing theme to dwell upon. In execution of the wishes of her late husband, this generous lady presented the Society with some thirty odd specimens of French and Italian birds, well mounted; also, a dozen of Audubon's rare and celebrated engravings of American birds—life size,—the whole accompanied with curiosities of art, medals, &c., of which a detailed list is herewith annexed.

No addition has been made to the collection of eggs; but your Society will be happy to hear that, owing to the President's efforts, the undersigned was enabled to begin the formation of a no less and important section—he

alludes to the collection of Canadian, West India, and other Foreign Woods. For the Canadian specimens actually exhibited, thanks are due to Dr. H. H. Miles and to the Honourable Commissioner of Public Works.

The undersigned begs to notice, also, the beautiful collection of United States Government Bronze Medals recently purchased. These bronzes were executed at the Washington Mint to commemorate important national events and keep alive the memory of the great men of the United States. A glance at the list herewith annexed shews that these Medals are classified in four distinct categories—Army, Navy, Presidential, and Sole National Medals. No doubt, antiquarians and others visiting our Museum will be delighted to see this precious collection, becoming year after year more and more valuable, as the original dies are always destroyed once the medal is struck.

Several other additions, of minor importance, but entitling them as well the generous donators to the sincere thanks of your Society, have been made to the Museum, a list of which is also annexed to this Report.

The undersigned believes that the effective services rendered by Mr. Mathison, the keeper of the rooms, deserve also a special mention in this Report.

Before surrendering his trust into better hands, the undersigned begs to add, in conclusion, that the department of Natural History is evidently in the way of rapid progress: every section is increasing almost every year.

But could not more attention be devoted to the collection of Woods? The undersigned hopes that our wealthy lumber-merchants will give their hearty support to this subject, and render the collection well worthy of your Society and of the Quebec lumber trade.

The undersigned has great pleasure in again returning his sincere thanks to the President and Board of Directors for the co-operation he at all times experienced during his term of office.

The whole respectfully submitted.

J. F. BELLEAU,
Curator of the Museum.

Quebec, January 10th, 1872.

DONATIONS TO THE MUSEUM.

By H. McHugh :—Fossil Shells, &c., &c.

By Miss J. LeSueur :—Three Cards pressed Fern Leaves.

By Crown Lands Department:—One box of Specimens of Woods, the growth and produce of Canada.

By Crown Lands Department:—Valuable Maps of the Province.

By C. N. Montizambert :—Collection of Medals and Old Coins.

By Mrs. Gibb:—A valuable collection of European Birds, Audubon's Engravings, Medals, Coins, Casts, and Natural Curiosities.

By A. Campbell :—A Pigeon and a Postal Card.

By H. McKay :—Indian Stone Implements and Pottery.

By C. Baillairgé:—Two old Musket-barrels found in the Revetment at St. Lewis Gate.

By W. Drum :—A piece of the Cat (ship) used by General Wolfe as a Floating Battery.

By J. U. Gregory :—Two Baleens of the Whale stranded at St. Joachim, August, 1871.

By H. S. Scott :—A Sepia, or Squid.

By Dr. Boswell :—Two Birds—an Owl and a Hawk.

By Miss K. Douglas:—Four Skins of Egyptian Birds, including those of the Male and Female Partridge of the Nile.

By A. Nicoll :—A Bird, Jaw of a small Shark, and a Flying-Fish.

By Major Pope :—A Model of the Original Block-House Fort on Cape Diamond, previous to the erection of the present Citadel.

By H. H. Miles:—Samples of Woods and Plants.

LIST OF SPECIMENS OF WOODS, &c., SENT TO THE MUSEUM OF THE LITERARY AND HISTORICAL SOCIETY, QUEBEC, BY H. H. MILES, ESQ., LL.D., DECEMBER 26TH, 1871.

J. M. LEMOINE, *Esquire, President of the Literary and Historical Society of Quebec:*

DEAR SIR,—I enclose a list of about 160 specimens of woods, vegetables, fibres, &c., Canadian and foreign, which, with your concurrence, have been sent to the Society's rooms for the purpose of being placed along with corresponding articles in the Museum.

I regret that in a few cases I have been unable to recover the names; but in most instances, both the common and the scientific names have been given and marked on the specimens.

Should arrangements be made in future for receiving into the Museum specimens of raw and manufactured materials, to illustrate various useful manufactures, &c., &c., I have by me a few, which, I think, might be serviceable, and which I should have much pleasure in contributing towards that object.

I remain, dear sir, yours very truly,

H. H. MILES,

Associate Member of the Quebec Literary and Historical Society.

RICHMOND SQUARE, QUEBEC, *December 26th*, 1871.

CANADIAN WOODS, SHEWING OBLIQUE AND TRANSVERSE SECTIONS AND BARK.

(TWENTY-FOUR SPECIMENS.)

Red Plum, (Prunus Americana.)

Cedar, (Thuya Occidentalis.)

Brown Ash, (Fraxinus Sambucifolia.)

White Ash, (Fraxinus Americana.)

Birch, (Fagus Ferruginea.)

White Elm, (Ulmus Americana.)

Red or Slippery Elm, (Ulmus Rubra.)

Tamarack or Larch, (Larix Americana.)

(2.) Hemlock Spruce (Abies Canadensis.)

Butternut (Juglans Cinerea.)

White Birch, (Betula Populifolia.)

Alder, (Alnus Viridis)—Green or Mountain.

Alder, Red, (Alnus Incana.)

Basswood (Tilia Americana.)

Iron or Lever Wood, (Oystrya Virginica ?)

(2.) White Oak, (Quecus Alba.)

Hickory, (Carya Amara.)

(3.) Maple, (Acer Saccharinum.)

" (Spicatum and Dasycarpum.)

Canadian Flax, (Linum Usitatissimum,)—stalk, flower, seed, and dyed.

MEXICAN AND CALIFORNIAN WOODS, ETC.

(THIRTY-SIX SPECIMENS.)

1. Pinus Douglasii.
2. Mexican Larch, (Larix Americana, var.)
3. Mexican Elm, (Ulmus Americana, var.)
4. Magnolia.
5. (2) Mexican Birch, (Betula Excelsa.)
6. Mexican Willow, (Salix Alba.)
7. (2) Poplar, (Populus Alba.)
8. Red Birch, (Betula Rubra.)
9. Blue " " "
10. Mexican Hazel, (Corylus Avellana.)
11. Mexican Apple.
12. Green Osier.
13. Walset Wood.
14. Vine Wood, (Vitis Perdifloria.)
15. Berasys Pennsylvanica.

16. Mexican Lilac, (Lynozia Vulgaris.)
17. Peach Wood, or Nicaragua Wood, (Cœsalpinia.)
18. Mexican Bush Maple.
19. Mountain Ash, or Service Tree, (Pyrus Aucuparia.)
20. Mexican Alder, (Alnus Glutinosa.)
21. Sumach.
22. Swamp Hickory, or Bitternut, (Carga Amara Paludinosa.)
23. Mexican Swamp Rose, (Rosa Paludinosa.)
24. Morus Fructoria.
25. Fustic Root.
26. Wood, Foliage, Bark, Seed, and Cone of the mammoth tree of California, (Sequia Gigantea.)
27. Box Wood, (Buxus Sempevirens.)

28 to 34. Duplicates and not named Mexican woods.

WOODS, FIBRES, ETC., TROPICAL AND OTHERS.

(SEVENTY-FIVE SPECIMENS.)

1. Cherimoyer (Anona Cherimolia)—West Indies.
2. White Lance Wood (Guatteria Laurifolia)—West Indies.
3. Blood Wood, Iron Wood (Laplacea Hematoxylon)—West Indies.
4. Cinnamodendron Corticosum, with bark of the same—West Indies.
5. Redwood (Erythroxelon Areolatum)—West Indies.
6. Jack fruit-tree (Arto-carpus Integrifolia)—West Indies.
7. Red Candle Wood (Amyris Balsamifera)—West Indies.
8. Yellow Candle Wood (Cassia Emarginata)—West Indies.
9. (4) Dog Wood (Piscidia Erythrina do Carthiginensis)—West Indies.
10. Casuarina Equisetifolia—West Indies.
11. Jamaica Ebony (Bruya Ebenus) with bark of same—West Indies.
11. (3) Braziletto (Peltophorum Linnæ)—West Indies.
12. Divi-Divi (Cœsalpinia Coriaria)—West Indies.
13. White Mangrove (Laguncularia Racemosa)—West Indies.

14. Star-apple (Chrysophillum Cainito)—West Indies.
15. White Bully Tree (Dipholis Salicifolia)—West Indies.
16. Redheart (?)—West Indies.
17. (2) Cocoa Nut (Cocos Nucifera)—West Indies.
18. Santa Maria (Calophyllum Calaba)—West Indies.
19. Black Bully Tree (Dipholis Nigra)—West Indies.
20. Hogberry (?)—West Indies.
21. Jamaica Elm (Cordia Gerascanthus)—West Indies.
22. Naseberry Bully Tree (Achras Sideroxylon)—West Indies.
23. Bastard Cabbage Tree (Andira Inermis)—West Indies.
24. Cassada Wood (?)—West Indies.
25. Bitter Damson (Simarula Officinalis)—West Indies.
26. Bluefield's Cedar, or Timbersweet—(Laurus Borbonia)—West Indies.
27. Sweet-wood (Nectandra)—West Indies.
28. Black Rosewood (Amyris?)—West Indies.
29. White Rosewood (Amyris Balsamifera)—West Indies.
30. Jamaica Beech (Fagus Sylvestris)—West Indies.
31. Wild Cinnamon (Canella Alba)—West Indies.
32. White Cedar (Cupressus Thuyoides?)—West Indies.
33. White Torch, or Candle Wood (Amyris?)—West Indies.)
34. Wild Tamarind (Acaeta Arborea)—West Indies.
35. Locust Tree (Hymenea Courbarli)—West Indies.
36. Pentedeshra Filamentosa—West Indies.
37, 38, 39. Specimens of heavy Australian Woods, (Victoria, N. S. W.)—(Names not given.)
40. Eucalyptus—Victoria, N. S. W.
41. Sarcocephalus Ovaifolia—Queensland, N. S. W.
42, 43. Australian Woods—Victoria, N. S. W.—(Names not given.)
44. Silver Gully Tree (Eucalyptus Acerbica)—Victoria, N. S. W.
45, 46, 47. Names not given—Victoria, N. S. W.
48. Eucalyptus Odorata (Peppermint Tree)—Victoria, N. S. W.
49. Honeysuckle, (Banksia Australis)—Victoria, N. S. W.

50. Coast Honeysuckle (Banksia Integrifolia)—Victoria, N. S. W.

51. Musk Tree—Victoria, N. S. W.

52. Bamboo (Bambusa Gigantea)—West Indies.

58 to 66. Duplicates of Laplacea Hæmatxoylon, Erythroxilon Areolatum, Amyris, Balsamifera, Piscidia Erythrinia and Carthaginensis, Bruya Ebenus, Laguncularia Racemosa, Chrysophillum Canaito, Dipholis Salicifolia, Cocos Nucifera, Hogberry, Nectandra.

VEGETABLES, FIBRES, ETC.

1. Cuba Matting (Paritium Elatum)—West Indies.
2. Fibre of Spanish Aloe (Agava Americana)—Mexico.
3. Cocoa Nut Fibre (Cocos Nucifera)—West Indies.
4. Sparto Grass and Hibiscus Eecalates—Ceylon.
5. Fibre of Thuya Gigantea, with bark and cordage of same, as used by inhabitants of Vancouver Island, British Columbia.
6. Skutched Fibre of "Linum Usitatissimum Canadensis," as from machine.
7. Fibre of Japanese Weed (name not given), as prepared for substitute for silk or cotton, but used in manufacture for mixture with these.
8. Humulus Lupulus, fibre of, (Lupulane)—samples of unbleached, bleached, and spun into thread—Canada.
9. Gutta-Percha (extract of Icosandra gutta), as imported from the Malay Islands.

LIST OF SPECIMENS OF WOODS OF THE CANADIAN FORESTS,

WITH THEIR ENGLISH, FRENCH AND BOTANICAL NAMES,

Presented to the Literary and Historical Society of Quebec by the Provincial Government.

No.	ENGLISH NAME.	FRENCH NAME.	BOTANICAL NAME.
1	Alder,	Aulne Commun	Alnus incana.
2	Ash, Mountain	Cormier, (Masquabina)	Pyrus Americana.
3	Ash, Rim	Frêne de Savane	Fraxinus juglandifolia
4	Ash, Swamp	Frêne rouge	Fraxinus pubescens.
5	Ash, Black	Frêne noir	Fraxinus sambucifolia.
6	Ash, White	Franc Frêne	Fraxinus Americana.
7	Aspen, Large-toothed	Grand Tremble	Populus grandidentata.
8	Basswood,	Bois blanc, (Tilleul)	Tilia Americana.
9	Beech,	Hêtre	Fagus ferruginea.
10	Beech, Blue	Charme	Carpinus Americana,
11	Birch, Black	Merisier rouge	Betula lenta.
12	Birch, Yellow	Merisier blanc	Betula excelsa.
13	Birch, White	Bouleau	Betula papyracea.
14	Butternut, Smooth	Noyer tendre	Juglans cinerea.
15	Button-wood,	Platane	Platanus Occidentalis.
16	Cedar, White	Cèdre blanc	Thuja Occidentalis.
17	Cedar, Red	Cèdre rouge	Juniperus Virginiana.
18	Cherry, Choke	Cerisier à grappes	Cerasus Virginiana.
19	Cherry, (Wild) Black	Cerisier noir	Cerasus Serotina.
20	Chestnut,	Châtaignier	Castanea Americana.
21	Chestnut, Horse	Marronnier d'Inde	Æsculus hippocastanum.
22	Cherry, (wild) Red	Petite merise	Cerasus Pennsylvanica.
23	Cotton-wood, (necklace poplar)	Peuplier du Canada	Populus monilifera.
24	Cornell, (Flowering Dogwood)	Cornouiller	Cornus Florida.
25	Elm, Grey or White	Orme blanc	Ulmus Americana.
26	Elm, Red	Orme rouge	Ulmus fulva vel rubra.
27	Elm, Slippery	Orme gras	Ulmus fulva.
28	Elm, Soft	Orme	Ulmus racemosa.
29	Fir, Balsam	Sapin	Abies balsamea.
30	Hemlock,	Pruche	Abies Canadensis.
31	Hickory, Nocker-nutt	Noyer à noix douces	Carya tomentosa.
32	Hickory, Rough Bark	Noyer dur	Carya alba.
33	Iron Wood	Bois dur	Ostrya Virginica.
34	Maple, Hard	Erable	Acer saccharinum.
35	Maple, Mountain	Plaine bâtarde	Acer spicatum.
36	Maple, Soft Curly	Plaine	Acer rubrum.
37	Maple, Soft, (plane)	Plaine blanche	Acer dasycarpum.
38	Moose Wood,	Bois barré, (Bois noir)	Acer Pennsylvanicum.
39	Oak, Black	Chêne noir	Quercus tinctoria.
40	Oak, Grey, (Lake)	Chêne gris	Quercus ambigua.
41	Oak, Red	Chêne rouge	Quercus rubra.
42	Oak, White	Chêne blanc	Quercus alba.
43	Oak, White (Ottawa)	Chêne blanc (Ottawa)	Quercus alba.
44	Pine, Red	Pin rouge	Pinus resinosa.
45	Pine, White	Pin blanc	Pinus strobus.
46	Pine, Yellow	Pin jaune	Pinus mitis.
47	Plum, Wild, Yellow	Prunier sauvage	Prunus Americana.
48	Poplar Balsam, or Balm of Gilead	Peuplier baumier, (Tacamahaca)	Populus balsamifera.
49	Poplar, (Common Aspen)	Tremble	Populus tremuloides.
50	Sassafras,	Sassafras	Sassafras officinalis.
51	Scrub Pine,	Pin gris (ou cyprès)	Pinus rupestris.
52	Spruce, White	Epinette blanche	Abies alba.
53	Spruce, Black	Epinette noire	Abies nigra.
54	Sumac,	Vinaigrier	Rhus typhina.
55	Tamarac,	Epinette rouge	Larix Americana.
56	Thorn, Apple	Pommettier rouge	Cratægus punctata.
57	Thorn, White	Seneller	Cratægus coccinea.
58	Walnut, Black	Noyer noir	Juglans nigra.
59	Willow, Black	Saule noir	Salix nigra.
60	White Wood	Tulipier	Liriodendron tulipifera.

LIST OF UNITED STATES GOVERNMENT MEDALS (WASHINGTON MINT) IN THE MUSEUM.

ARMY MEDALS.

1. Washington before Boston.
2. Major-General Horatio Gates—Saratoga—1777.
3. Colonel George Crogan—for Sandusky—2nd Aug., 1813.
4. Major-General W. H. Harrison—for the Thames—5th Oct., 1813.
5. Governor Isaac Shelby—Battle of the Thames—5th Oct., 1813.
6. Major-General Winfield Scott—for Chippewa and Niagara.
7. Major-General Edmund Gaines—for Fort Erie—15th Aug., 1814.
8. Major-Gen. P. B. Porter—Chippewa, 5th July, 1814; Niagara, 25th July, 1814; Fort Erie, 17th Sept., 1814.
9. Major-General Brown, " " " " "
10. Brigadier-General Miller, " " " " "
11. Brigadier-General Ripley, " " " " "
12. Major-General Macomb—Plattsburg.
13. Major-General Zachary Taylor—Resaca de la Palmare—1846.
14. Major-General Z. Taylor—Monterey—Sept. 1846.
15. Major-General Z. Taylor—Buena Vista—22nd Feby., 1847.
16. Major-General Winfield Scott—Vera Cruz, &c.—1847.
17. Major-General U. S. Grant, N.S., N.L.A.—Vicksburg—Chattanooga.

NAVY MEDALS.

18. John Paul Jones—"Serapis."
19. Captain Thomas Tington.
20. Captain Hall—Capture of the "Guerrière."
21. Captain Jacob Jones—Capture of the "Frolic."
22. Captain Decatur—Capture of the "Macedonian."
23. Captain Bainbridge—Capture of the "Java."
24. Captain Lawrence—Capture of the "Peacock."
25. Lieutenant McCall.
26. Captain Perry—Capture of the "British fleet on Lake Erie."
27. Captain Warrington—Capture of the "Eperokiet."
28. Captain Blakeley—Capture of the "Reindeer."
29. Captain Thos. Macdonough—Capture of the fleet on Lake Champlain.
30. Captain Henley— " " "
31. Lieutenant Step. Cassin—1814— " " "
32. Captain Biddle—Capture of the "Penguin"—1815.

33. Captain Chas. Stuart—Capture of the "Cyane"—20th Feby., 1815.
34. Major-General A. Jackson—Battle of New Orleans—6th Jany., 1815.
35. Captain W. Burrows—4th Sept., 1813.

PRESIDENTIAL MEDALS.

36. The Cabinet Medal.
37. Thomas Jefferson—1801.
38. James Madison.
39. James Munroe—1817.
40. John Quincy Adams—1825.
41. Andrew Jackson—1829.
42. Martin Van Buren—1837.
43. John Tyler—1841.
44. James R. Polk—1845.
45. Zachary Taylor—1849.
46. Millard Fillmore—1850.
47. Franklin Pierce—1853.
48. James Buchanan—1857.
49. Abraham Lincoln—1862.
50. Andrew Johnson—1865.

SOLE NATIONAL MEDALS.

51. Captain Percy—State of "Pennsylvania"—Lake Erie—10th Sept., 1813.
52. (*Missing.*)
53. Major-General Winfield Scott—Chapultepec—Melino del Rey, &c.
54. Rescue of the Officers and Crew of the United States brig "Janus."
55. Captain M. Graham—"Rescue of Martin Kystice."
56. The Shipwreck Medal.
57. United States Coast Survey—Gallantry and Humanity—1846.
58. Japanese Embassy Medal.
59. Doctor Frederick Ross—Skill and Humanity.
60. Colonel Armstrong—Destruction of Kiltanning, "Indian Village"—1756.
61. Indian Race Medal.
62. Captains Creighton, Low, and Stuffers—1854.
63. Doctor Hossack—Arts and Science, &c.
64. Commodore M. C. Perry, Boston—Merchants, &c.

Literary and Historical Society of Québec.

Abstract of the Treasurer's Account for 1871.

Dr.

1871.		
Jany. 7.—To Balance:		
Historical Document Fund	$130 42	
Life Members' Fund	54 65	
General Fund	479 72	
		$664 79
Jany. 12.—To Government Grant		750 00
March 1.—To Interest on Deposits		38 27
Nov. 4.—To Received for Subscriptions		752 01
		$2,205 07

Cr.

1871.		
By Rent and Insurance	$302 75	
Salaries	153 40	
Books, Periodicals, Papers, Printing, and Advertizing	683 63	
Museum	161 50	
Gas and Fuel	126 60	
Furniture	87 05	
Collector's Fees, &c	39 45	
Petty Expenses, Repairs, and other charges	96 73	
		$1,651 11
1872.		
Jany. 1.—By Balance brought down:		
Historical Document Fund	$130 42	
Life-Members' Fund	54 65	
General Fund	368 89	
		553 96
		$2,205 07

Quebec, March 19th, 1872.

(Signed,) T. H. GRANT, *Treasurer.*

Literary and Historical Society of Quebec.

LIST OF MEMBERS, 1872.

LIFE-MEMBER:—THOMAS GLOVER, ESQUIRE.

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Andrews, F. H.
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Baillairgé, Chas.
Baillairgé, L. J.
Becket, P.
Belleau, J. F.
Bennett, Benson.
Benson, W. P.
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Billingsley, F.
Blanchet, Hon. J. G., M.P.
Blanchet, H.
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Boswell, W., M.D.
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Bowles, J.
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Browne, W. P.
Bruce, R.
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Campbell, W.D.
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Fraser, A.
Fraser, Hon. J.
Fry, H.
Fry, J. S.

Geggie, D. H.
Geggie, J.
Gibb, Jas.
Gibsone, J. F.
Gibsone, W. C.
Gilmour, Jno.
Garneau, P.
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Glass, H.
Glass, Jno.
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Hall, G.
Hemming, H.
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Hossack, W.
Hamilton, R.
Hamilton, Rev. Chas.
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Joly, H. G., M. P.
Joseph, A.

Lampson, F.
Langlois, Jean, M.P.
Langlois, C. B.
Lamontagne, E.
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Ledroit, T.
LeMoine, Gasp.
LeMoine, J. M.
Lesage, S.
LeSueur, P.
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Maclaren, W. M.
Macleod, D. R.
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McCord, T.
McCallum, W. C.
McGreevy, Hon. T., M.P.
McHugh, L. H.
McKay, J.
McLeod, R.
McNaughton, Jno.
McNaughton, P.
Miles, H. H., LL.D.
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Montpetit, A. N.
Moodie, W.
Morgan, F.
Middleton, R.
Mountain, M. G.
Murphy, O.
Motz, J.

Neilson, Jno.
Neilson, R., M.D., Surg. Dom. Artillery.

Oliver, J. M.
O'Meara, D. D.

Paradis, O. E.
Parkin, E. B.
Patton, D.
Peebles, P.
Peters, H. J.
Peters, S.
Pope, E.
Plees, Rev. R. G.
Poston, C.
Poston, T. I.
Poston, W.
Powis, Rev. H. D.
Powis, H. W.
Price, E. J.

Quebec, J. W., Lord Bishop.

Rattray, D.
Rawson, Rev. C. W.
Renaud, J. B.
Renfrew, G. R.
Rhodes, Col. W.
Robertson, A.
Rowand, A., M.D.
Roy, F. E., M.D.
Roach, J.
Ross, J. G.
Richardson, J. H.
Richardson, O. L., jr.
Richardson, W. C.
Rickens, J. C.
Riddell, Lieut., 60th Rifles.
Russell, W. E.
Russell, W.

Sealey, J.
Sewell, H. R.
Sewell, L.
Shaw, P. A.
Shanly, W.
Sheppard, H. C.
Sheppard, W. G.
Simons, W.

Smith, C. F.
Smith, H. S.
Smith, R. H.
Stanley, W., jr.
Stevenson, J.
Stevenson, M.
Scott, H. S.
Stewart, Hon. A., Judge.
Stewart, C. G.

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TRANSACTIONS

OF THE

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OF QUEBEC.

SESSION OF 1872-73.

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OF THE

Literary and Historical Society of Quebec.

SESSION OF 1872-73.

PAPER I.—"ON SOME ADDITIONAL INCIDENTS IN CONNECTION WITH THE SIEGE AND BLOCKADE OF QUEBEC, IN 1775-6."

BY LIEUT.-COL. WILLIAM F. COFFIN, OTTAWA, ONTARIO.

(Read before the Society, Dec. 18, 1872, by the President.)

MY DEAR DR. ANDERSON,

I received, a day or two since, the *Transactions of the Literary and Historical Society of Quebec*, for 1871-72, addressed to me, I think, in your own handwriting. Whether right or wrong, pray accept of my best thanks, which, under any circumstances, are your due for an excellent paper, from your pen, on Canadian history.

It so happens that the period of history embraced in this paper interests me very deeply. I feel as if I took a hereditary share in the siege and blockade of Quebec in 1775-76, ninety-seven years since. My grandfather, my father, and two uncles, were all present in Quebec during the siege; and the first took a more active part in that remarkable event than has ever been assigned to him. Will you allow me, under the inspiration of your article, to say something in vindication of his claims to honorable notice, and to explain why so little has hitherto been said about him?

Indeed, until now I never saw his worthy name in print. His was a modest and a brave nature. If, in the spirit, he

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should read your paper—and, as all good things tend Heavenward, there is no good reason why he should not do so—I have no doubt but that he would stare,

"And wonder how the d—l he got there."

Nevertheless, by the aid of the printer's factotum, there he is. You say that Mr. LeMoine has attached this note to Thompson's narrative:—"There were other Canadian "worthies who can legitimately share the credit of this *fait* "*d'armes*—Chabot, Coffin, and the captain of an English "transport, Barnsfare."

Justly, indeed, are they called "worthies." Not a man of them was a professional soldier: they were simply citizens—common *men*, but men who felt that they had a duty to perform, and did it. I don't think that they took much order in their going; but they went at once.

Often, in my childish days—for I was in Quebec in 1812, '13, '14—have I heard my father tell how, on that tremendous New-Year morning of 1776, their white-faced mother had sent him and his brother John from the Upper-town to the *Près de-Ville*, to ascertain if their father was alive or dead; how they found him, and how he looked—very grave, but very glad; how they, the two boys, had been allowed to crawl out of the embrazure, on the snow, to where lay the bodies of Montgomery and his staff, stark, and as yet undisturbed; and then, of the free breathing, and of the exultation of the town-folk, not unmingled with heartfelt thanksgiving.

Years after, I found myself once more in Quebec, in the old house in St. Lewis-street, with uncles John and James, and that paragon of spinsters—albeit imbued somewhat with the Puritan gravity of her New-England origin—aunt Anne Coffin; and often, over that small black mahogany table, reflecting the wine-glasses and the decanter of crusty old port, have I heard uncle John repeat the above incident, and many

a like old-world story, while the wintry winds howled without, and the old stove roared a triumphant *refrain* within. By Jove, sir, what a cosy contrast were those low-beamed rooms, and the warmth and the snug comfort of those days, to the fashionable apartments and agueish atmosphere of our own!—and how naturally one's heart warms with the recollections of dear old genial Quebec!

But to pass on. Old uncle James died, and then John; and good aunt Anne was laid in her peaceful grave far away from her quiet forefathers. Some time after her death, there were found in the drawer of a bureau, which had been her special property, a number of papers bearing upon the siege of 1775-76, which prove the part her father took in it, and from which, with your leave, I shall quote at length.

John Coffin, her father, though an unobtrusive, undemonstrative man, was a resolute loyalist. Born and brought up in Boston, he resisted the revolution, and made himself so obnoxious that he was, by name, proscribed, and his property confiscated, by act of the Massachusetts Legislature, September, 1778. Forewarned by friends, and taking time by the forelock, he freighted a schooner, of which he was part-owner, with his family and worldly goods, and coasted round from Boston to Quebec, where he must have arrived in or about June, 1775,—seeing that on the 23rd August, 1775, he bought, by *Acte* made before J. A. Panet, *fils*, N.P., from la dame Veuve Lacroix, a piece of land at the *Près-de-Ville*, described as "un terrain de trois cent pieds de front, situé "le long du fleuve St. Laurent, au bas du Cap aux Diamants, où "passe le chemin qui conduit à l'Anse des Mères." In a letter from John Coffin to his brother Nathaniel, in England, dated 1777, in relation to his losses at the siege of Quebec, he speaks of his property at the "Potash." I believe this to be the same property referred to by Hawkins, in his *Siege of Quebec*, as being "formerly occupied by Mr. Racey as a "brewery; at the time of the siege this was called the

"*Potash.*" He went to work here, at once, to establish a distillery, when his labours were interrupted by the invasion of the country in September; and from that time to the end of the siege his industry was paralyzed.

Nor was this the only trouble of the time; for, in the letter above quoted from, he states that "his brig had been stopped "at Lisbon, by the British consul, six months, as the property "of a rebel, and at the very time when I was carrying a "brown musket for his Majesty at Quebec."

To what effect he carried his brown musket in the King's service will now be shewn by documents which speak for themselves, and require but a very short introduction. These services had attracted attention in quarters capable of valuing them, and are best explained by the following letter, received by him from Colonel Allan Maclean, 87th Regiment, who commanded the garrison of Quebec during the siege of 1775-76, and, apparently, spontaneously given:

"QUEBEC, 28th July, 1776.

"SIR,—As I am, in a few days, going to England with despatches from the Commander-in-Chief, I should be glad to know if I could be of any service to you. Power to do you any material service I have none; but your conduct during the siege of Quebec, last winter and spring, makes it a duty on my part to give you my testimony and approbation of every part of your conduct. Truth must always have some weight with his Majesty and his ministers, who, I am certain, wish to reward deserving men like you. To your resolution and watchfulness on the night of Dec. 31st, 1775, in keeping the guard at the *Près-de-Ville* under arms, waiting for the attack which you expected; the great coolness with which you allowed the rebels to approach; the spirit which your example kept up among the men, and the very critical instant in which you directed Capt. Barnsfare's fire against Montgomery and his troops,—to those circumstances alone I do ascribe the repulsing the rebels from that important post, where, with their leader, they lost all heart.

"The resolutions you entered into, and the arrangements you made to maintain that post, when told you were to be attacked from another quarter, were worthy of a good subject, and would have done honor to an experienced officer. I thought it incumbent upon me to leave with you this honorable

testimony of your services, as matters that were well known to myself in particular; and I should be happy, at any time, to have it in my power to be useful to you; and do assure you that I am, with truth and regard, sir, your most obedient and most humble servant,

"(Signed,) "ALLAN MACLEAN.

"Mr. Coffin."

This letter is endorsed:

"From Col. Allan Maclean, 87th Regt., commanding the garrison "at the siege of Quebec, 1775-76, to John Coffin, Esq."

This generous testimony, on the part of Colonel Maclean, sufficiently establishes the share which John Coffin took in the defence of the *Près-de-Ville*. He was not in command; he was not an officer; he was simply a volunteer-soldier defending his hearthstone. But the emblems of command do not always confer the power; and on occasions like this, the epaulet of the officer often gives place, tacitly and not unwillingly, to the man—let his garb be what it may—whose promptitude and force of character are equal to the emergency. Chabot and Picard, ready and valiant volunteers, may have been in command. Captain Barnsfare, no doubt, directed the guns, which were probably carronades, landed from his own ship. That all the brave men present nobly did their duty, is sufficiently proved by the event; but Colonel Maclean avouches that to the resolution and watchfulness of John Coffin,—to his coolness and spirit and example, and to the critical promptitude with which "*you directed Barnsfare's fire against Montgomery and his troops*," is to be ascribed the repulse of the rebels, when, losing their leader, they lost all heart.

In corroboration of the above, it may properly be stated, in this place, that Henry Caldwell, lieutenant-colonel commanding the British militia at the siege of Quebec, certifies, by a document given under his hand at Quebec, May, 1787, that:

"John Coffin, Esquire, served in the British militia, under my command, "during the siege of this town by the rebels, from November, 1775, to

"May, 1776; during all which time he conducted himself and behaved with "the greatest spirit, zeal, and activity in the King's service, which, by his "example, was very much promoted, particularly on the attack of the 31st "December, when he very much distinguished himself."

And further, in his letter to Murray, published by the *Literary and Historical Society of Quebec*, he has written, at pages 12 and 13:

"Soon after the enemy was repulsed at that side, some old women brought an account that the rebels had surprised the post at *Sault-au-Matelot*, and had got into the Lower-town. Part of the garrison, that had lately behaved so well, were struck with a panic, and began, some to hide their arms, and some to throw them into the river. The officer began to feel a little frightened, when a *Mr. Coffin, a British gentleman, who, with his wife and twelve children, had taken refuge there, expecting to find there peace and quietness, and who had served previously in our militia, drew his bayonet, and declared he would put the first man to death who laid down his arms or attempted to abandon his post; by which means he re-established order, and, with the assistance af Captain Barnsfare, who commanded the seamen, got two of the guns pointed at the opposite sides, in case Arnold's people, having got into the Lower-town, should attempt to force the post on that side,*" *&c., &c.*

It appears, moreover, that, independent of the services thus loyally and energetically rendered, Mr. Coffin had been subjected to heavy pecuniary losses from the invasion of the Americans and the siege of Quebec. He had abandoned "affluence"—as Colonel Caldwell says, in another part of his letter—at the command of duty; and of the scanty relics of his property, brought with a large family to Quebec, he lost during the siege, by the hands of the Americans, effects of the value of nine hundred and sixty-one pounds, Halifax currency (£961 cy.) These pecuniary losses, though proved before commissioners appointed by Sir Guy Carleton, and subsequently admitted as correct by the report of the committee of the Executive Council of the Province, 3rd March, 1802,—hereinafter more particularly referred to—were never compensated.

The above statement introduces, very naturally, the following correspondence. Among the papers which have

come into my possession is a letter in the handwriting of John Coffin, of Quebec, addressed to his brother, Nathaniel Coffin, also proscribed by name in the Boston Confiscation Act, and who, flying from Boston, had taken refuge in England in 1775. In this letter, which bears date 29th July, 1778, is the following passage :

"Two or three days since, I called upon General Carleton, and inquired "what was the prospect of compensation for losses sustained by particular "persons in consequence of the rebels coming into the Province "of Canada in 1775. His answer was that Colonel Christie had received "£3,000, Col. Caldwell £2,000, and William Grant £1,500; and he "believed that was all they proposed paying in England,—that the rest "of the account was returned this spring, to be further inquired into. "I told him I had an account among them, the foot of which was about "£860, stg., and that the money would be very convenient to me. He "replied that neither of those gentlemen could in any respect be better "entitled to that favor from Government than I was. He advised me "to draw up a memorial to Gen. Haldimand, who, he said, was not "unacquainted with my conduct in this garrison, and he would present it "himself; which he accordingly did, and told Gen. H., before me, that Mr. "Coffin was very serviceable during the siege, and that his conduct on "the 31st Dec., 1775, at the post attacked by Mr. Montgomery, was more "like an old experienced officer than like a gentleman not bred to arms; "and desired Gen. H. to transmit my account to the Treasury, and "recommended the payment. He answered he would do it with much "pleasure. I told them I was much obliged to them both. Gen. Carleton "replied: 'You are not at all obliged to me; what I have said to Gen. "'H. is no more than doing you justice. I should have mentioned you "'in my publick letter, but was afraid of the consequence to your friends,' "(meaning that he imagined the rebels would resent the part I acted upon "my friends). He advised that my agent should apply to the Treasury, "and that I should furnish him with a copy of my account, lest the one "sent home by Gen. H. should be mislaid in the office. He also proposed "that my friend should call upon him to back the application, which "I make no doubt he will do most heartily, as he never promises without "meaning to perform. He is one of the best private characters in "the world; his publick one you are not a stranger to. I relate the "before-mentioned conversation (much as it may savour of vanity) to "let you know what dependance I can have upon Gen. C.'s interest in "this affair. * * * I hope Gen. Carleton's interest with the Treasury "will be sufficient to procure the payment of my account."

In accordance with the suggestions made by Sir Guy Carleton, in the conversation alluded to, John Coffin appointed his brother to act as his agent in London, who was furnished with a copy of the account, "lest the one sent home by General Haldimand should be mislaid." It is evident, from the whole tenor of this letter, that, when it was written, General Carleton was on the point of departure for England. Mr. Coffin, therefore, advised his brother and agent to act upon the further kind suggestion of Sir Guy, and to "call upon him to back the application," which, "as he never promises without meaning to perform," he did "most heartily," in the following letter, dated "Jenningsbury, December 25th, 1779." If it did not procure the payment of Mr. Coffin's account, the fault certainly did not lie with Sir Guy Carleton:

"JENNINGSBURY, Dec. 25, 1779.

"SIR,—I have received your letter, and am sorry to learn your brother's misfortunes render it now necessary for him to apply for any assistance beyond his own industry. Having observed in all his conduct, from his arrival in the Province of Quebec till I left it, a constant attachment and zeal for the King's service, as well as the manner of a prudent, worthy man, I could not but interest myself for him. Yet his conduct and judicious behaviour on the morning of the 31st Dec., 1775, gave him a still stronger claim on me; for to him, with the assistance of Barnsfare, I attribute the repulse of the rebels on the side of Quebec where Mr. Montgomery attacked in person; while the success on the other was very different, and brought the town into no small danger. Now, whether we consider the strength of this post, the number allotted to its defence, or the former services of the officer who commanded, we might have expected as much, at least, from him,—a remarkable proof, this, that former services and greater numbers may be outdone by superior vigilance and good sense of gentlemen, though not used to arms. After all this, sir, I cannot but lament that it is nowise in my power to forward Mr. Coffin's wishes. I might, 'tis true, bear witness to his merits; but this, probably, would hurt, not serve,—such is the state of things. I have, therefore, only to assure you of my esteem for him, and that I am, sir,

"Your most obedient and most humble servant,

"(Signed,) "GUY CARLETON.

"Mr. Nathaniel Coffin."

I think it will be admitted that, up to this point, sufficient evidence has been adduced to satisfy any judicial mind that John Coffin is entitled to share, and to share largely, in the honour due to the defence of the post at *Près-de-Ville*, at the most critical moment of the siege.

The documents above produced prove that whatever may be the merit justly assigned to Barnsfare and others for the defence of this post, an equal measure of praise was, at least, due to the American loyalist, John Coffin.

What that merit was, time has long since shewn. On that memorable winter morning, the flame of fidelity to the British empire, paling throughout the American continent, flickered uncertainly over the walls of Quebec. At midnight the desperate Arnold had forced the St. Roch suburb and the Lower-town, and, although obstinately resisted, doggedly fought on, hoping and looking for a junction with Montgomery. An hour later, and a resolute volley had decided the fate of a great country. The brave Montgomery was slain,—his detachment annihilated; Arnold was wounded; the American army was in full retreat. Quebec had been saved, and the flickering flame of fidelity to the British empire blazed up therefrom, thenceforth and forever, a beacon of light, inextinguishable in Canada.

And yet it may be asked why, if the conduct of this gentleman was so conspicuous, and so well known at the time,—why was his name unnoted in General Carleton's despatch which has immortalized the brave French-Canadians, Colonel Dupré, Major Ecuyer, and Captains Bouchette, Laforce, and Chabot, of the marine? This question has been already answered in the letter from Mr. John Coffin to his brother in England, dated 29th July, 1778, given at length above:—" General Carleton replied, 'You are not " 'at all obliged to me; what I have said to General " 'Haldimand is no more than doing you justice. I should

" ' have mentioned you in my publick letter, but was afraid
" ' of the consequences to your friends,'—meaning that
" he imagined the rebels would resent the part I acted
" upon my friends."

Those who have read the historical essay which prefaces the *American Loyalists*, by Lorenzo Sabine, cannot fail to recall the severities exercised at this time in the insurgent States, and the general exasperation which prevailed against the loyalists, increased in intensity by the failure before Quebec; and will be able to appreciate the thoughtful consideration of Sir Guy Carleton, and to understand that the public mention of Mr. Coffin's name in a despatch announcing so signal a triumph to the British arms, might have been productive of very grave inconvenience to his friends in Massachusetts.

Two interesting features in the story of that eventful night have been brought out into stronger light by the preceding letters from Colonel Maclean and Sir Guy Carleton, and are worthy of a passing commentary.

First: In your paper on Canadian history, read the 6th March, 1872, you quote from Hawkins, " on a point of some interest," as follows:—" Soon after the repulse of the enemy before the post at *Près-de-Ville*, information was given to the officer in command there that Arnold's party from the General Hospital, advancing along the St. Charles, had captured the barrier at the Sault-au-Matelot, and that he intended an attack on that of the *Près-de-Ville* by taking it in the rear. Immediate preparations were made for the defence of the post against such an attack, by turning some of the guns of an inner barrier, not far from the old Custom-house, towards the town.

The fact of this *alerte*,—fortunately a false alarm, which might, if true, have been a serious matter,—and of the measures taken to meet it, are confirmed by Colonel

Maclean, in words very much to the credit of John Coffin:—"The resolutions you entered into, and the "arrangements you made to maintain that post"—to wit, that of the *Près-de-Ville*—"when told that you were to be "attacked from another quarter, were worthy of a good "subject, and would have done honour to an experienced "officer." Colonel Allan Maclean was in command of the garrison; to him all reports and returns were made. If any man in Quebec knew what had occurred, he did; and this letter was written in the July following, six months after the occurrence. The above paragraph, therefore, while it approves the fact of the alarm, points out the man whose resolution and forethought had foreclosed the danger, had it come.

Second: In the letter from Sir Guy Carleton, dated from the country-seat of his family, Jenningsbury, December 25th, 1779, speaking of Mr. Coffin, the gallant general says: "His conduct and judicious behaviour on the morning of the "31st December, 1775," (he meant 1st January, 1776,) "gave "him a still stronger claim upon me; for, to him, with the "assistance of Barnsfare, I attribute the repulse of the rebels "on the side of Quebec where Mr. Montgomery attacked in "person; while the success on the other was very different, "and brought the town into no small danger. Now, whether "we consider the strength of this post, the number allotted to "its defence, or the former services of the officer who "commanded, we might have expected as much, at least, "from him,—a remarkable proof, this, that former services "and greater numbers may be outdone by superior vigilance "and the good sense of gentlemen, though not used to arms."

This passage points to a foregone conclusion. The recollection of the general in actual command, four years after the event, embraced, at once, all the vicissitudes of that changeful night—the first disaster, the distress, the danger, and then the sudden relief, the assurance of safety—the

deathless pause between stern peril and hope and life revived and assured. It brought forward into rapid relief the vigilance and good sense of the volunteer who saved the town, as compared with the carelessness or sloth of the more experienced officer, who had nearly lost it.* When Arnold attacked the *Sault-au-Matelot* at five A. M. of the 1st January, 1776, he carried the first barricade by surprise; the guard and the advanced posts were taken almost without firing a gun; Adjutant Mills became prisoner, and Captain Lester narrowly escaped. For a time the town was "in no small danger," indeed. But then arose hesitation; Arnold himself had fallen desperately wounded; a change of commander ensued; a pause took place. In the meantime the inner barrier had been firmly closed. Sir Guy Carleton became aware of the danger, and, with the inspired promptitude of the true general, directed * Captain Lawes, of the Royal Engineers, covered by Captain McDougal, of the Royal Emigrants, to sally out through Palace-gate and take the assailants in the rear. The defenders, at the second barrier, had already been reinforced by Caldwell, Nairne, Dambourges, and Anderson (who was killed). The disaster was thus converted to success, and the enemy, placed between two fires, surrendered. In writing his kindly letter, the mind of the writer glanced back over contemporaneous facts: he bethought him of the peril which would have ensued had the palissades at the *Près-de-Ville* been as carelessly guarded as the first barrier at the *Sault-au-Matelot;* and he drew a comparison honorable to the "vigilance and good sense of gentlemen, though not used to arms."

And now to resume the thread of our story. On the 9th of May, 1776, the siege was raised. Peace came, but not plenty. Whatever credit John Coffin may have acquired

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* See *Journal of an Officer*, relating to the principal occurrences during the siege of Quebec, 1775-6. London: Simpkin & Co., Stationers' Court. 1824. (A copy of which is in the Library of the House of Commons at Ottawa.)

during the siege, he got nothing else. He had been ruined by friend and foe alike. His establishment at the *Près-de-Ville* had been wrecked. His ships at sea had been captured. He applied for redress, and got none. In those days, and at a long distance, the Imperial Government was, beyond all peradventure, mean and partial. To save the British treasury, they had recourse to subterfuges unbecoming in a huckster. References, which took months to send, were referred for consideration and re-referred for re-consideration. Some men were put off on the most frivolous pretences, and put off to the end of their lives. Other men—such as Christie, who got £3,000; Caldwell, who got £2,000; and Grant, who got £1,500—had friends at court; but Coffin had no other friend but Carleton, who did not stand well with the ministry of the day,—whose advocacy would "hurt rather than serve,"—and, therefore, got nothing. His claims, though proved and admitted, were never paid.

Years passed on without remedy and without hope, until, in 1796, when, after having exhausted all expedients and applications to obtain pecuniary compensation, he was, in consequence of a proclamation of Sir Alured Clarke in 1792, induced to ask for an equivalent for his losses, in the shape of a grant of land. His application was favourably received. But delay is the chronic distemper of governments. They all take it in turn, only the older they grow the worse it becomes. Thus, six years elapsed before he got an answer. It came at last, in 1802, and in the following shape:

"Extract of a Report of a Committee of the whole Council, dated the 3rd of March, 1802, on the petition of John Coffin, of Quebec, Esquire,—approved by His Excellency the Governor-General in Council, 15th March, 1802:

"The Committee give full credit to Mr. Coffin's representation, in this "petition, of his losses and sufferings at Boston previous to his arrival "in this Province, in the year 1775, resulting from his approved loyalty "and attachment to his Majesty's person and government, and of his

"losses in this Province since his arrival here, occasioned by the invasion "of it by the rebels, and the consequent blockade of this city for the "whole of the winter of the year 1775-6. Some of the members of the "Committee have an intimate knowledge of the facts (so honourable to "Mr. Coffin) that are mentioned in the certificate annexed to his petition. "But, independent of Mr. Coffin's well-founded pretensions to every "reasonable consideration on the part of the Government, on account of "his losses and services, the Committee, from their personal knowledge "of his merits, can have no hesitation in recommending that he may "obtain the prayer of his memorial;—that is to say, that he and his wife "and their nine children may have one thousand two hundred acres each "of her Majesty's waste lands, to be located in any one of the townships "set apart for loyalists and other deserving subjects.

"[*Certified,*] (Signed,) "H. W. RYLAND."

This Order-in-Council confirms and crowns the story of John Coffin's services and disappointments; for it did *not* give him the land. It had been ordered, but not located; and hence arose a new difficulty. At this time a conflict of jurisdiction was rife in relation to grants of land. The Imperial Government claimed to have the disposal of all the wild lands in Canada. The Provincial Government demurred to these exclusive pretensions: they claimed the right to deal with their own. Hence came interminable minutes and references, reports and counter-reports, until, between the two battle-dores, the plaintive applicant was shuttlecocked and shaken into utter bewilderment, to find himself, on awakening to consciousness, deep down in the bottomless pit of the Colonial-office.

Thus it fared with John Coffin. In 1796 he had asked to be allotted land in Wakefield. In 1802 he petitioned for land in Ely. In 1803 he asked for land in the township of Kildare. In 1806, during the administration of the Honorable Thomas Dunn, he once more prayed for a free-grant of land wherever he could get it. But all his landscapes, put them in any light, proved to be but dissolving-views. In 1816; ten years after, there was received from "Henry Goulbourn," dated "Downing-street, 17th December," the ultimatum of Lord

Bathurst, to the effect that "he did not feel himself at liberty "to make a grant to Mr. Coffin's family upon any other "terms than those prescribed by the present regulations." In the meantime John Coffin had gone to his grave, without compensation in land or money; and as one of the "regulations" above referred to involved the payment of a fee of five pounds on letters-patent for every lot of two hundred acres, the family felt, probably, looking at the then value of wild lands per acre, that "*le jeu ne valait pas la chandelle.*"

Independent of this, the family of Mr. Coffin was at this time scattered the wide-world over—the sons in the army or navy; the daughters, with one exception, married to officers in these services. No opportunity had offered for concerted action. The whole subject appears to have been thought of lightly, if at all, and to have been forgotten.

And now, with your leave, I will give you the sequel. In 1847 the papers above recited came into my hands, and remained unheeded, as of little worth. In 1860, thirteen years after, the Public Lands Act (2 Victoria, cap. 23,) was passed, which authorized the allotment of lands, or the substitution of scrip, in all cases where sanctioned by previous order-in-council, and, very properly, without limitation as to time. On the strength of the order-in-council above cited, and of the fact that I was the only surviving son of my father, one of the children of John Coffin, I claimed twelve hundred acres of land. To gain my point, I assumed at once the vocation of a *teredo*. I became a bore. I began by boring good Sir Edmund Head, who took it very gently; then, for seven years, in every successive year, I bored the Crown-Lands department, until there arose a commissioner of large mind and superior aptitude for business, and who, therefore, never allowed himself to be bored. He grasped the point of the question at once, admitted the righteousness of the claim, and awarded me land-scrip for twelve hundred

acres of land,—recognizing, thereby, the validity of an order-in-council passed fifty-two years before in reward of services only practically compensated after an interval of *ninety-seven years!*

I think it a very good thing to have had a grandfather; but it is a better to be grateful to his memory; and I have felt it to be my duty—profiting by the opportunity afforded by your excellent paper (an opportunity, by the way, which had not before offered)—to put on record a few facts relating to his life, most honorable to him, and which have been very beneficial to me.

OTTAWA, *2nd November*, 1872.

Paper II.—A WHALING VOYAGE TO SPITZBERGEN IN 1818.

By JAMES DOUGLAS, M.D.

(*Read before the Society, March 23rd, 1870.*)

[The perusal of a journal which was kept in high northern latitudes fifty-five years ago, may not be without interest at this time, when so great attention is being given to the late discoveries in the Arctic regions, and to the expeditions now being fitted out in the confident hope of reaching the North Pole, through the open water which is supposed to exist to the north of Spitzbergen.

This journal is given *verbatim et literatim*, as written at the time; and allowance must be asked for it as the unaided production of a youth of eighteen years of age, who went out as surgeon of a whaler, which, in pursuit of the objects of its voyage, reached the high northern latitude of 81.56.

It was written *currente calamo*, without any pretensions to style or scientific knowledge, and without any idea of its being seen by any excepting the members of the writer's own family.

The intrepid Arctic navigators—the brothers Dannatt, the Scoresbys (father and son), Capt. Sadler, and others, who navigated the Polar regions at the close of the last century and at the early part of the present, have passed away, and, excepting the younger Scoresby, have left no record behind them. I perfectly recollect, however, that Capt. Ed. Dannatt and Capt. Ashe expressed their belief in the existence of land at or in the vicinity of the Pole. They based their belief on the appearance of the heavy ice and on the detached icebergs which, during the summer season, were drifted by the current to the southward.]

While a medical student in Edinburgh, during the winter session of 1818, I received an appointment as surgeon of the ship *Trafalgar*, of Hull, Captain E. Dannatt, commander, during a voyage to the Arctic regions; and at the same time was notified to report myself at Hull on or before the 12th March, for the purpose of submitting myself to the medical examiner appointed by Government to examine into the qualifications and fitness of candidates. This examination

is not very strict, and consisted in ascertaining that I had served an apprenticeship of five years to Dr. Tho. Law, a nephew of Lord Ellenborough, and that I had passed a session at college in Edinburgh. However, with my certificate of qualification, I entered into office at once, at a salary of four guineas a month, one guinea for every whale caught, and one guinea for every thousand seals killed. I was supplied with everything needful, with the exception of clothes and bedding.

March 13th.—The King's officers came on board this morning and mustered the crew, to the number of 36. This is done by the Government, which allows a bounty of £300 to each ship, as well as the spirits, tea, coffee, sugar, and all other dutiable articles, duty free. On their part, the owners are bound to carry and man at least seven boats, with seven men to each boat. As this, during war-time, is difficult, and as Government is extremely desirous to encourage the fishery, it exempts the requisite number of harpooneers, boat-steerers, and other skilled hands, from the press-gang; and obliges the owners to fill up the requisite crew by taking Shetland-men, in passing: these are a hardy race of men, and, from their almost amphibious habits, are admirably adapted for boat-work.

The fresh provisions and other stores being got on board, the *Trafalgar* left dock, passed the Spurn-lights with a fair wind, and got fairly to sea with a light S. W. wind, which continued until the 20th, when we made Fair Island, a very rocky, barren, and mountainous-looking place, inhabited by a few poor fishermen, who certainly surprised me by their faculty of keeping their souls and bodies together. There is a very diminutive breed of sheep on the island, with wool of extreme fineness, with which the natives make gloves, mittens, and stockings, of exquisite beauty and quality, and which they bartered with us for any necessaries we could spare to them. In the afternoon of the same day, Sunbrough

Head, the most southerly point of Shetland, came in sight; and we were boarded by a pilot, who took us in due time into Brassa Sound. During my stay in Lerwick I was most hospitably entertained by Mr. Morrison, an agent, who made my stay there a very agreeable one. Next day being Sunday, I attended divine service, where I heard a most eloquent and impressive sermon by a venerable old man, in a church far inferior in architectural beauty to an ordinary barn. The singing was *scottice*, a regular skirl. The next day I went to the top of the hill behind Lerwick, which commanded a view of the land and of a great part of the island. The prospect was grand and sublime in its sterility, extremely rocky, mountainous, and very barren, merely affording pasturage to the diminutive sheep and the equally small breed of horses for which Shetland is celebrated. The town of Lerwick is unpaved and very dirty, particularly in wet weather, which seems to be the normal state of the climate.

The whole trade of Lerwick is carried on between it and Leith in two small sloops, which take to Leith eggs, poultry, stockings, and salted geese,—bringing back such necessaries as they require. Lerwick is principally noted as the rendezvous of the Greenland-men on their way to and from the north, and as the place where their crews are completed. On Thursday I took an excursion inland for a few miles, and was amply repaid for the want of roads by some of the most rugged and romantic scenery I have ever seen, although there were no shady groves and purling streams to grace the landscape.

On returning to the ship I found all hands busy in preparing the ship for the ice. Some were bending gaff-topsails and fixing booms to the main and fore sails, striking the royal masts, and generally putting the ship into such a condition that at any time, and particularly when in the ice or very short-handed, the ship could be worked with very few hands. Others were fitting out a machine called a crow's-nest, to be

placed on the top of the main-top-gallant-mast, to protect the man on the look-out when the ship is in the ice. This crow's-nest, as it is called, looks like an old-fashioned pulpit: it is made out of a cask or puncheon, well lined with skins or Russo matts; the very top of the top-gallant-mast serves as a seat; a shifting weather-board protects the look-out, who is able to get in by thrusting himself through a trap-door in the bottom. The whole affair looks extremely cosy and comfortable. Others of the men were engaged hanging up quarters of fresh beef and other meat,—among which were a number of legs of mutton intended for the owners and their friends on the return of the ship to Hull. In the evening, as a boat was pushing off from the stairs, two men jostled and fell overboard; one was at once picked up. When pushing off a second time, one of the crew reached to pick up a hat on the water, and found a man under it, senseless; when got on board he soon recovered.

During the remainder of the week the crew were variously employed in preparing the vessel for the ice, and in laying in stocks of eggs, fowls, frozen milk, &c. The crew were again mustered, together with 18 Shetland-men—in all, 54 souls. They were then divided into three watches, and again subdivided into boats' crews—7 boats, with 7 men in each, viz.: a harpooneer in the bow, a boat-steerer, who stands on the platform on the stern, and a seaman called a specksoneer, who has charge of the whale-lines which lay coiled in the middle of the boat. The Shetland-men only row: all pull, except the steerer, who steers with a long oar fastened to a pivot on the stern. For some days the ship was prevented proceeding to sea in consequence of gales of wind from the N.W., alternating with heavy fogs. One vessel, the *Prescott*, Greenlandman, in attempting it, went on the rocks, and was totally wrecked in the Sound by the rocks going through her bottom.

On the 1st of April we succeeded in getting to sea with a fair wind, with occasional heavy squalls. Being Sabbath-day, I,

for the first time, performed my functions as chaplain, by reading the common-prayer used by the Church of England. As the captain, first officer, and most of the crew, however, were Wesleyans, I made compensation by reading the whole or a part of one of Wesley's sermons. The singing was more remarkable for its force than its sweetness. In the evening got a thorough drenching by shipping a heavy sea.

April 3rd.—Wind still fair; great numbers of birds hovering about the ship, rather less in size than a hen, and of a dirty white color; they are very fearless of man, very ravenous, and are sometimes caught by the men with a line and a hook baited with a piece of any fat meat. When taken and daubed over with soot, and let off again, they are instantly set upon and destroyed by the others. They are called Mallemouches, or by the sailors Mollymawks. They are said to be very rarely seen within sight of land. I was very gravely assured that they never approach land, but hatch their eggs under their wings. Whatever my opinion may be as to the former, I yield my full faith in the latter statement.

7th.—Wind still fair, and weather very fine. This afternoon were visited by a "Bottle-nose," the *Delphinus-Delphis* of naturalists; it appeared to be about 20 or 25 feet long. Although the ship was going at the rate of six or seven miles an hour, it kept playing about us for some hours. Its evolutions and gambols on the surface of the water were very beautiful. Many small birds, somewhat less than a sparrow, about the rigging, indicating our vicinity to the ice.

8th.—Very stormy and dark; wind N.E., and excessively cold. As the day advanced it blew harder, with occasional sleet and snow, which rendered the decks dangerously slippery. Towards the evening it blew a hurricane, and the sea ran mountains high. The sails were all clewed up, except the close-reefed fore-top-sail, and that only to give the ship steerage-way.

9th.—Good Friday.—The wind still boisterous, but intermittent. About 11 o'clock we got among the ice for the first time, in 72 north latitude—longitude not known. Ice seemed newly formed, and was in small flat pieces, which, from their friction against each other, were round. This kind of ice is called by the seamen "pancakes." As the ship bored through them, we found the pieces getting gradually larger and larger; and the heavy swell we had in the morning almost entirely subsided. After boring through the ice until moonlight, the ship was laid-to among pieces from 20 to 40 feet in diameter, and of irregular shapes. We now experienced no night, only a duskiness for a couple of hours.

10th.—Weather still stormy, with heavy falls of snow and sleet. A good many seals on the pieces of ice, but the weather too bad to lower the boats for them.

11th.—Wind blowing with increased violence, with a very heavy swell; a circumstance most unusual among ice. In consequence of the ship laboring so hard and beating with so much violence against the ice, were obliged to get out to sea again to prevent the vessel being staved. Intensely cold. About noon the weather cleared up, and we found ourselves close in to the island of Jan Mayen. This island was first discovered by the Dutch, and for many years was frequented by them. They built huts for the purpose of boiling the fat of the whale and of the seals. They made more than one attempt to winter on it, but failed, the men being always found dead on the return of the vessels in spring. It is now entirely abandoned to the Polar bears and the white foxes. It is rarely seen by the Greenland-men, and only occasionally by the vessels in search of seals. It is very rugged, rocky, and mountainous; the highest peak is called Beerenberg; it is a volcano, and used to emit considerable quantities of fire, smoke, stones, and ashes. Of late it has been quiet, or, rather, no eruption has been observed, perhaps from not being so much frequented. Several of the smaller hills, from

their appearance, seem to have had a volcanic origin. At night, the wind abating, the ship stood away from the island, lest it should turn calm or blow on shore.

12th.—Weather beautiful and nearly calm; Jan Mayen N. by E., about 12 miles off.

13th.—Wind from N.E. again, and a strong gale. Threw overboard 30 tons of ballast to lighten the ship. Sails close-reefed, and a very heavy sea.

15th.—Gale continues; at noon, by observation, were in latitude 70.26 N., having been driven two degrees to the south by the gale. In the evening, saw the top of Beerenberg for the first time, distant between 60 and 70 miles.

16th.—Weather beautiful and clear; ship beating to windward with all sails set, in a clear sea. In the afternoon were visited by two finners—the *Balaena-Physalus* of naturalists; they gambolled about the vessel, apparently feeding, for a considerable length of time. The larger one could not be less than 90 feet long. Finners, when full-grown, are much longer than the true whale, and are readily distinguished by a large fin on the back. They are warm-blooded, and breathe the air, which, of course, they are obliged to come to the surface to do. In expiring, they, like all other cetaceous animals, eject a quantity of mucus—not water, as is often supposed. They possess, like quadrupeds, a heart, lungs, diaphragm, liver, &c. They are not so fat as the *Mysticitus;* the whalebone is shorter, broader, and brittle,—consequently, of no value or use; their velocity in the water is greater, and their progress is performed by much more elevated curves or bounds. In consequence of their amazing muscular strength and activity in the water, they are never attacked by the fishermen.

17th.—Weather dull, with occasional light showers of snow. At mid-day it cleared up, and found ourselves in streams

of thin ice; Jan Mayen N.E., distant about seven miles. The mountain distinctly seen from its base to its top; its height is about 7,000 feet; the summit seemed to be smoking. Saw numbers of seals on the ice, but could not succeed in killing any of them, as, being older and wiser, they tumbled into the sea at our approach.

18th.—Nearly calm, and the weather beautifully clear. We lay close in to the island, so close that we enjoyed a fine view of the icebergs attached to the land. These icebergs are immense masses of ice attached to the land, shooting perpendicularly out of the water to the height of some hundreds of feet; they are generally transparent, and of a delicate light-blue colour. From the innumerable variety of figures they represent, they have a very fine effect; indeed, nothing can be imagined more awful and sublime than such a Polar prospect on a fine clear day: the calmness of the sea,—the infinite numbers and varieties of birds, contrasted with the huge icebergs,—the mountains covered with snow, with occasionally the dark naked rocks at their bases. In the evening the scene was enlivened by the arrival of some small Dutch vessels in search of seals. These are uncommonly scarce, and are supposed to have taken their annual migration to the north. Many thousands are annually killed at the west ice, principally by the Dutch, who fit out a great many small vessels for the purpose, and are very dexterous. They leave Holland late in February or early in March, and proceed direct to the ice, which they strive to make in latitude 67 or 68 N., and return early in May. They are generally very successful, much more so than the British, who send no vessels expressly for the purpose. Some of the Greenland-men occasionally call at the west ice, as we are now doing; and if, after exploring it for a few days, they, like us, do not meet with seals, they proceed to the north, to the more profitable fishery of the whale. Seals are gregarious, and at this season are found in flocks of many thousands. At this time they are young; and I do not know

whether it is from their age or from the torpidity caused by the cold, but they allow the sailors to get on the pieces of ice and knock them on the head with a club. After their migration to the northward they are very wary, and make into the water on the first approach of an enemy.

19th.—Quite calm, and beautiful clear weather; attempted to shoot some birds, but, owing to the extreme cold, I could not hold the gun. The birds principally about the ship are loons, a curious bird, about the size of a wild-duck—black, with a white breast and belly; the wings are placed very far back, the legs long and web-footed: it possesses the singular faculty of being able to fly under water, not so fast as in the air, but still with a tolerable degree of velocity. Flocks of them occasionally pass the ship under water, and in clear calm weather are easily seen from the deck.

20th.—Fine weather, and fair wind. Relinquished our search for seals, and bore away to the north.

21st.—Strong wind from S.E. Ship boring to the north through streams of light ice. Weather extremely cold. During last night lost sight of Jan Mayen and of most of the birds which used to hover around us. Now and then only a solitary bird, called a burgomaster, to be seen; they are very large and tall, and perfectly white. They are seldom or never seen on the water, but either in the air or perched on a pinacle of the ice; they are very shy.

23rd.—At noon we were by observation in lat. 74.30, and weather excessively cold.

24th.—All hands busily employed in fitting-out the whale-boats: six lines, each about 140 fathoms, are smoothly spliced together, and coiled systematically in each boat, from the centre of the coil to the circumference, so that there may be no possibility of their fouling. A harpoon is attached to the line,

by the medium of a few fathoms of very fine and flexible rope. The harpoon itself is about three feet long, and is fitted with a handle six or eight feet long. Each boat is provided with a pole about twenty feet long, called a Jack-staff, carrying the ship's private signal. This is hoisted when any boat has struck a whale, to serve as a signal to the ship, as well as to the other boats, for assistance. There are, likewise, in each boat, three or four lances, to dispatch the whale when exhausted; a wooden kid, or small bucket, to throw water on the line when running out, to prevent combustion from the friction; and two long knives to cut holes in the tail for the ropes used in towing the whale to the ship. There is always a small and sharp axe in the bow, ready to cut the line in case it should run foul. Each boat, fully fitted out, is hung by tackles clear of the ship's side, and can be lowered into the water in a few seconds.

25th.—Passed some floating icebergs, looking like ships under sail at a little distance. Being now on the fishing-ground, a man is constantly stationed in the crow's-nest, on the look-out.

26th.—Fine clear weather; huge masses of ice on all sides, some shooting to a great height, like spires. Some high pieces with flat tops, and the many smaller pieces interspersed, struck me forcibly as bearing a strong resemblance to a large town in winter. By obs. lat. 76.43 N. Cold extreme, everything fluid being frozen on the slightest exposure; even the rum, when exposed on deck, is rendered quite thick, like frozen oil. We now enjoy continual day, as the sun revolves round us without ever setting; the difference being that it is south at noon and north at midnight. Our passage to the north obstructed by packed ice. An immense flock of seals passed us on their migration northwards.

27th.—Early this morning, the ice opening, we made way to the northward, threading through the pieces with great care. Again surrounded by birds—burgomasters, malli-

mawks, loons, dufkies, roaches, and small party-colored birds, called Greenland parrots. From the shelter of the ice the sea is as smooth as glass, and the cold not near so intense. At noon, were by obs. in lat. 77.40 N. A large finner passed us. During the evening several unicorns, the *Monodon-Monoceros* of naturalists, came and sported around the vessel. They were apparently from 12 to 20 feet in length. Their color is a dirty white, covered with black spots. The males have one horn projecting from the upper jaw, which varies, according to the age of the animal, from a few inches to 12 feet. This horn is twisted from right to left spirally, and for hardness and capacity to receive polish is equal to the best of ivory; the horn is of no known use to the animal; it is perhaps merely an attribute of the male. We made fruitless attempts to *strike* one, but without success, as they were exceedingly shy.

28th.—The man in the crow's-nest gave notice of a whale coming towards the ship; two boats were instantly manned and lowered. At a short distance it stopped to breathe; the boats were within a few yards of it, when it took the alarm and made off. As it was close to the ship, I had a capital chance of witnessing its motions; it lay half a minute or so on the surface, with the crown of its head and its back out of the water; it then blew a quantity of air and mucus, like steam, through the air-holes on the top of the head, and gradually sank three or four feet, as gradually rising again; it again breathed and sank. This was repeated several times, till, being alarmed by the approach of the boats, it suddenly ducked its head, curved its back, and, giving its huge tail a flourish in the air, made off. When we on deck saw Mr. Ashe, the first officer, push out his bow-oar, jump up, and seize his harpoon, ready to strike, we made sure of the whale; and when we saw it make off, I know that several lookers-on distinctly broke the third commandment. In the afternoon a number of unicorns sporting round the ship, but we could not succeed in striking one of them.

29th.—At 1 A.M. saw the land to the eastward, and stood towards it till 9 o'clock, when we were close in-shore. It presented a chain of high craggy mountains, covered with snow; five of them in particular were very striking and peaked, and appeared to be as high as Beerenberg on Jan Mayen. No signs of vegetation—nothing but icebergs, bare black rocks, and a background of icy mountains. We were on that part of the coast of Spitzbergen called Magdelena Bay. We did not land or make any stay, but proceeded along the coast to the N. We passed several icebergs, some of tolerable size. One we saw at Jan Mayen, 1400 feet high, did not seem much larger than some we see here. Capt. Dannatt and Mr. Ashe inform me that one iceberg near the N. end of the island is not less than 1200 feet. I am never weary of admiring their varied and fantastic shapes and indescribably beautiful colours, which are generally a pure and transparent sapphire blue, with layers of white, which are probably formed by the partial liquefaction and congelation of successive falls of snow. These icebergs are all grounded; and those we meet floating at sea are the portions which become detached and fall into the sea, which they do with a great noise and commotion. Continued to the N. Another ship in company. Saw a whale, but as it was pursued by their ships' boats, took no notice of it. Tried to get some seals lying on a piece of ice, but failed. Saw another whale; sent two boats after it; but, after an unsuccessful chase of three hours, they were signalled to return on board.

30th.—Ship plying to the N. through the ice; got a heavy blow from one of the pieces. The London ship in company with us saw and struck a whale, which they succeeded in killing in three hours, but not until it had killed one of their men by a stroke of its tail; his body was put into a box, and placed in the mizen-top for the purpose of being taken home to his friends.

May 1st.—This morning, a few minutes after midnight, a sailor, dressed up with skins, Russo matts, an enormous wig of horse-hair and oakum, came to the ship's bows as Neptune. His wife, as Amphitrite, dressed in an equally fantastic manner, hailed the ship, ordering the sailors to back the main-yard. Then, coming on deck, they were mounted on a gun-carriage, by way of a car, and drawn along the ship's decks to the after-hatchway; they were then conducted in state to the between-decks, where, the crew being mustered, Neptune made a speech, that he, the God of the seas, was glad to see them; and as some of them, his loving subjects, had never passed the north cape of Europe (71.10 N.), he would, assisted by his wife, shave them, so that henceforth and forever they might have the privilege of navigating his dominions north of said cape. Those who had not been in Greenland before were brought out, one by one, and, being seated on a large cask, Neptune's wife daubed their faces with a vile composition of soot, tar, and oil, which was scraped off by Neptune with a razor made of a rusty iron hoop. There was no appeal; every one must submit. One or two obnoxious lads were roughly treated: being asked a question, as soon as the mouth was open to answer, the brush was thurst into it. When called up, my plea for exemption would hardly have been listened to if I had not had the key of the spirit-room, and used it forthwith. The ceremonies concluded with a dance and a double allowance of rum. Bitterly cold; ther. 40 below zero. In the afternoon two whales rose near the ship; the boats got very near them, but could not succeed in striking either of them.

2nd.—Thick foggy weather, and intensely cold. The rigging covered with a saltish rheum arising from the sea. It is deposited on the men's faces and clothes; from its excoriating effect on the skin, it is commonly called "the barber." This mist or fog does not exist far above the level of the sea, as in the crow's-nest it is quite clear. The ship laid-to all day.

3rd.—Ship still laid-to by fog; numbers of unicorns about.

4th.—Still laid-to, anchored to the ice.

5th.—Blowing hard from N., with insufferable cold, rendering a person exposed to it unable to articulate from torpidity or contraction of the muscles of the face. Got a very heavy blow from a piece of ice, which made the ship's bells ring, and fairly pitched me out of my chair, under the grate. No material damage sustained. The ice coming down and threatening to close us in, set all sail, and stood away to the S. Passed a Polar bear on a piece of ice, but were too anxious to escape the danger which threatens us to stop and attack it. Compared to what I had seen in menageries, it seemed a large one, but was informed that it was not more than half-grown. In the evening escaped from our dangerous position in the ice, leaving two vessels beset, there to remain in great danger until the ice opens again, or the current carries them three or four degrees to the south.

6th.—Ship still making her way to the southward, among heavy ice. Again in danger of being closed in; the only passage was between two heavy masses of ice, which, under the influence of the wind or current, were approaching each other. When nearly through, the pieces came in contact with the ship, and crushed the two quarter-boats to pieces; extremely glad to get off so cheaply. At one o'clock were out of danger from being beset in the ice. During the afternoon, when walking the deck with Capt. Dannatt, I perceived two objects on the surface of the water. Looking at them attentively, I became convinced that they were two human faces, and at once gave the alarm. A general laugh, and an exclamation that they were a couple of walrusses, set me to rights. We tried to harpoon them, but without success.

8th.—Wind more moderate. One ship in company with us, proceeding to N.W. Ran against a piece of ice, which

started some of the planks on the starboard bow. Noon, lat. by obs. 79.58 N. Saw a whale, and sent 6 boats after it; but after a fruitless chase of two hours they were recalled. At 6 P.M. saw the vessel we had been in company with in the morning, with a signal of distress flying. It had struck upon a piece of ice and been seriously damaged; as, however, it was to windward of us, and as the ice lay very cross, we could not easily get near them, so we pursued our own course. The ship was the *Laurel*, of Burlington.

10th.—Strong gales of wind and little ice. Saw several whales, but too stormy to lower the boats. In the evening, weather more moderate; received a visit from Capt. Cook, of the *Elizabeth*, of Hull, who had just killed a unicorn, so large as to yield two butts of oil. Just before midnight sent two boats after a whale, but without success.

11th.—Fine weather, and calm. This forenoon an immense sword-fish—*Delphinus-Gladiator*—passed close to the ship. It is said to be the greatest enemy of the whale; it is very rarely seen so far north. In strength and velocity in the water, it equals, if it does not exceed, any known fish. Weather being so fine and mild, I went a-shooting, and shot a number of roaches, dufkies, loons, and snow-birds. Stuffed a couple of each, and gave the rest to the men for sea-pies.

12th.—Some Dutch ships in company. This morning a whale rose in their midst: each vessel sent two or three boats to wait where they expected it to rise. I anticipated a diverting scene when it did rise, and was not disappointed. All was hurry-skurry and confusion, which frightened the fish and caused it to flourish its tail in the air and make off. Lat. by obs. 79.57 N. Went on board one of the Dutch ships. The captain, a young man, spoke some English. He had been five weeks off Jan Mayen, where he had killed three thousand seals. The masters of two of the other vessels were his brothers. On taking leave, he gave Mr. Ashe and me each a square bottle of very excellent gin.

13th.—Weather calm. Went a-shooting, and killed forty-one birds—enough for all hands for a couple of days.

14th.—Beautiful weather; the *Lord Wellington* and the *King George* in company. At 9 A.M. two whales rose; each ship sent a couple of boats; one of the fish was struck by a harpooneer of the *Lord Wellington*, who at once discovered that he had only got fast to a sucker. It was very soon killed, and found to be little larger than a unicorn. The attention of all the boats was then directed to the female, as they all knew, by experience, it would not leave its young one, but would hover about the place. For nearly four hours it ran about like a mad creature, closely pursued by the boats of the three vessels. At one o'clock it was struck by a harpooneer of the *King George*, who, being assisted by all the boats, soon killed it. I have often heard of the maternal affection of the whale, and here saw a fine instance of it. About 11 P.M. we were visited by a very fine sea-horse; made several attempts to strike it, but failed. If shot and wounded, it would make off; if killed, it would sink like a stone. As the ice was closing in, the *Lord Wellington* and we made the best of our way out, leaving the *King George* beset.

15th.—Beautiful clear weather; the *Lord Wellington* in company. Saw two whales; each ship sent two boats after them; the harpooneer of the *Lord Wellington* struck one; and as the two boats we had sent were off in pursuit of the second whale, Capt. Dennatt lowered two others and sent them to assist the *Lord Wellington*. Their whale, when struck, went perpendicularly downwards, where it remained upwards of half an hour; it then came to the surface, apparently quite exhausted; and as the boats were scattered about where it was expected to rise, it was immediately harpooned again, and it dived a second time before recovering its breath; but, being obliged to rise to breathe, two more harpoons were driven into it; and as it was from breathlessness obliged to remain to breathe, several whale-lances, some twenty

feet long, were thrust into its body. It made several ineffectual struggles to get away, but was too far spent; and as some of the whale-lances had penetrated the lungs, it began to eject blood; and as eight boats were lying alongside, plying their long lances into its body, it soon expired and turned on its back. At that moment the look-out at our own mast-head called out: "A fall!—a fall!" Everything was instantly in an uproar; those who were in bed rushed on deck undrest, and tumbled into the boats, which were instantly lowered into the water and pushed off, the man in the crow's-nest pointing with his arm in the direction they were to go. As we on deck could see nothing for the ice, we were told by the look-out that one of our boats was fast to a whale, about three miles to leeward. In a few minutes he called to us on deck to say that the second boat had also struck the whale. By this time, the two boats which had been assisting the *Lord Wellington* having returned, the ship made sail with all the spare boats in tow, being directed by the man at the mast-head. When near the boats which had struck the whale, the loose boats were cast off and dispersed where it was expected to rise. It did rise quite exhausted, but instantly dived again, and never came up. In the meantime the ice was coming together, and beset the boats; attempts were made to drag up the whale, but without success. The ends of the lines were then taken on board the ship, with the intention of either dragging up the whale or drawing out the harpoons. The lines, however, broke, and the whale was lost. The ship immediately took the boats on board, and rejoined the *Lord Wellington.*

16th.—Beautiful weather, and quite mild. Ship making her way to the N. through heavy ice. At noon we were by obs. in lat. 80.11 N. The two discovery-ships last year only reached nine miles further, being then stopped by the solid continent of ice.

17th.—Strong breezes of wind. A ship, called the *Spencer*, of Hull, in company with us. During the forenoon a whale rose; each vessel sent boats after it. After playing about for a considerable time, it was at last struck by one of the *Spencer's* harpooneers; it was close to us when it was struck a second time, and shortly afterwards a third time. Soon afterwards a serious accident had like to have happened: one of the *Spencer's* harpooneers, approaching it for the purpose of lancing it, received a blow from the whale's tail, which knocked the boat out of the water; it struck the boat a second time, so that it went to pieces and sank, through the weight of the lines, leaving the men struggling on the surface: they were, however, speedily picked up by the other boats. The harpooneer was standing up, and was knocked out by the first stroke of the animal's tail. As we did not speak the *Spencer*, cannot say whether any of the men were seriously injured. In two hours afterwards the whale was killed.

18th.—Beautiful weather, but cold. Saw two whales, but could not succeed in striking either of them; we perceived that one of them had scars on its back, about the size of harpoon-wounds. A flock of wild ducks, with most beautiful and variegated plumage, alighted on the ice close to the ship; they were taller and more slender than English wild-ducks; they flew before I could get my gun loaded. Evening very cold; sea frozen over to the thickness of an inch, forming what is called, by Greenlandmen, *bay-ice*.

19.—Strong breezes of wind. A whale being seen at a distance, boats were instantly lowered: the crews were as usual in them, when, in his eagerness to get away, the boat-steerer of one of them took the fall entirely off the cleet. The immediate result was that, not being able to support the weight, the stern of the boat dropped and precipitated the men into the water. One had presence of mind to catch hold of the ship's ladder; the other four were struggling in the water astern, as the ship was going at the rate of seven

knots. The ship was instantly laid-to and boats sent to their rescue: before they reached them, however, two had sunk; one came again to the surface, and was laid hold of by a boat-hook; the other was seen under water and brought up by lowering a harpoon. Both were inanimate, and it was only after a long-continued use of the ordinary means that vitality was restored. I am afraid to say how long one of them remained without evincing any signs of life. At any rate, the whale was left undisturbed.

20th.—My 19th birthday. Strong gales of wind, but, as we were among heavy ice, did not feel their effects. Saw two or three whales, and sent six boats after them. The whales were not running, but feeding and playing about. One rose near one of the boats, and the harpooneer, pulling the boat right on its back, struck it; it ran a very short distance down, when it came up again and lay on the surface, splashing and flourishing its tail and fins in the air in such a dangerous manner as to prevent any of the boats getting near enough to strike it a second time. After a while, however, it went down, and rose again close to the edge of a heavy floe of ice, where it acted the same game over again: it lay evidently watching the boats; and when any of them attempted to approach it, it turned on its side, shaking its fin in the air, with which it evidently knew that it could destroy them. Mr. Ashe, the first officer, seeing how matters stood, and knowing it would escape if not very speedily secured, got on the piece of ice at a little distance, carrying his harpoon, and, with two of his men dragging the line, made his way until he got just over the whale, when he threw his harpoon with such force as to make it penetrate the whale's body to the stock. It instantly dived, and ran five lines out before it again came to the surface; and when it did, it was as wicked and mischievous as before. One boat at last succeeded in striking it, but, when backing astern again, received a blow of its tail. The harpooneer, seeing the impending blow, leaped back among the men; it struck the boat's bow obliquely, so as

not to injure it; but the concussion threw the boat-steerer into the water. As the whale began to run, the line was at once divided by the axe, and the boat returned to pick up the steersman, who was almost frightened to death. He did not know how he had got into the water, or what had happened to him: being, however, utterly useless, the crew took him on board the ship, which was close by, and, taking another in his place, joined the hunt again. In the meanwhile, the whale was again setting the boats at defiance, and it was only after some time that two of them, rowing rapidly past it, threw their harpoons into it. It was then killed, but not until five hours had elapsed from the time it was first struck. When dead, it turned over on its back; holes were then made through its fins, which were lashed across the belly. Similar holes were made in the forks of its tail, through which ropes were reeved, and then, all the boats fastening on, the whale was towed to a neighbouring mass of ice, to which the ship was already anchored. The whale being then brought alongside, the harpooneers, with spikes on the soles of their boots, got upon it, and cut a piece about four feet wide by six feet long, leaving its base uncut. A hole was then made, through which the loop of a strong rope was passed, and fastened by a fidd. The rope was then rove through a block in the rigging, and its end taken to the windlass. This arrangement or contrivance not only keeps the carcase steady, but, as the surface is removed, enables the whale to be gradually turned and another surface exposed and removed. When this was done, which only took a few minutes, the harpooneers and steerers cut out pieces of about a ton weight, which were hoisted on deck by ropes and pullies connected with the winches. As fast as these pieces were hoisted on deck, they were thrown down the hatchway between the decks. The lower lip of the carcase was cut up and hoisted on board; the enormous tongue, which is a mass of nearly pure fat, was sent up; the whalebone which is attached to the roof of the mouth was then removed; the

fins and tail were cut off and hoisted up; and the whale gradually turned over, until it was entirely flinched. The whole time occupied was nearly three hours. The fat on the surface of the body was about ten inches thick, which is considered to be very little. The fat on the body of a full-grown female is frequently, I am told, two feet or more in thickness. I am surprised to find the fat firm, and more like gristle than the ordinary fat of animals. When boiled down, however, Mr. Ashe informs me that it yields 75 per cent. of pure oil. While the whale was being cut up we were surrounded by immense numbers of mollymawks and snow-birds, which could easily be knocked down with a stick. The sailors amused me by throwing some pieces of blubber among them, too large for any single bird to swallow; when one got hold of it, he was instantly attacked by the others, and almost torn to pieces, until he quitted it. This went on until some bird more powerful or more dexterous managed to get off with it.

MALE.

1st.—Length of whalebone, seven feet and one inch.

After the whale was flinched, the decks were cleared and cleaned; the ship was cast off from the ice, and stood away to the N.E. One of the men, who yesterday was nearly drowned, suffers to-day from acute inflammation of the lungs.

21st.—Light airs, and beautiful mild weather. In the afternoon two whales rose close to the ship, and remained sporting on the surface in a very loving manner. The boats

were instantly lowered and pulled towards them; one of the boats ran against the whale, and the harpooneer, who had just seized his harpoon, was thrown down; he, however, recovered himself in an instant, and plunged his harpoon into its back. As the whale, however, was in no hurry to go away, the man again seized his harpoon, and, throwing his whole weight on it, gave it a good shove. It then set off nearly perpendicularly downwards, and with such velocity that the harpooneer was hidden in the smoke caused by the rapidity of the lines running round the bolland, and this in spite of the water thrown upon it. A second boat was just in time to render aid before the lines were run out. The whale came up again in about an hour, nearly dead—not from fatigue or exertion, but from the enormous, almost incredible, weight of water it had sustained. It ran out seven lines, each line 140 fathoms long, and went apparently perpendicularly down; if so, it must have been subjected to a pressure of 980 fathoms of water. But, even if one or even two hundred fathoms are allowed for obliquity, still the pressure must have been almost incalculable. It lay almost motionless, until three boats pulled on its back and struck their harpoons into it: it ran another length of line out of their boats, and then stopped. It was instantly surrounded by all the boats, and in the space of forty minutes more was killed. The ship was again anchored to a piece of ice, as yesterday, and the whale brought alongside and cut up. It also was a male animal, and very lean.

MALE.

2nd.—Length of whalebone, eight feet and one inch.

22nd.—A gale of wind; nothing worth notice.

23rd.—Gale continues with increased violence. Saw two or three whales, but too stormy to lower a boat.

24th.—Quite calm, but a dense fog. We hear whales blowing on every side, but cannot see them. Six boats, however, were sent off with strict orders not to separate. They returned unsuccessful: they heard and saw several, but could not get near enough to strike one. At noon it cleared up, and discovered us in a large basin formed by heavy ice, with numbers of whales sporting about in a very playful manner; but, being quite calm, they invariably made off whenever they heard or saw the boats. In the afternoon Capt. Dannatt got into a boat, and, posting himself on the edge of a piece of ice, resolved to wait in hopes that one would rise near him. He was not waiting more than twenty minutes till one rose about forty yards off. He pulled towards it; but, finding the boat going athwart it, he directed the men to cease pulling, and ordered the boat-steerer to scull quietly. It lay shaking on the surface of the water, as if paralyzed by a sense of its danger, until Capt. Dannatt struck his harpoon into it; it then made off, running only two lines out, when another harpoon was struck into it, and in an hour after it was first struck it was killed. It was a male fish, but very fat. During the act of flinching, a harpooneer cut his foot severely.

FEMALE.

3rd.—Length of whalebone, three feet and four inches.

25th.—Stormy and cold weather.

26th.—Strong wind and clear. Ship threading her way to the northward. At 5 P.M., after an exciting chase, a whale was harpooned; it ran out five lines, and was killed in two hours and a-half.

MALE.

4th.—Length of whalebone, six feet and six inches.

27th.—Strong breezes and clear weather. At noon it began to blow hard from the eastward, which drove the ice together and obliged us to get out as quickly as possible. At 7 P.M. we got to the open water in lat. N. 79.30, where we again joined the *Lord Wellington*. In escaping from the ice we left two vessels beset, who were more to leeward than we were.

28th.—A whale was seen, and three boats were sent after it, one succeeding in harpooning it; it ran six lines out, and the greater part of a second boat's lines. It remained nearly an hour before it came to the surface again, and then rose at a considerable distance, and not far from the *Lord Wellington*. Capt. Dannatt sent two boats to his brother's assistance; both struck it before it went down again, and in 25 minutes more it was killed. As usual, the ship was anchored to the ice. The whale was brought alongside and flinched, to use the common term.

MALE.

5th.—Length of whalebone, seven feet and five inches.

Shortly after it was got on board and the decks cleared, three or four whales were seen, and boats sent after them. The harpooneer who had struck the last whale got close to one of them, but, through the fault of the boat-steerer, not close enough to strike. He threw his harpoon, which did not penetrate. He, however, was fortunate enough to strike another, which remained down a considerable time. As soon as it rose, three more harpoons were driven into it; but, instead of going down again, as was expected, it set off with great rapidity towards the heavy pack of ice to windward. As the men knew that if it once gained the shelter of the close ice they would likely lose it, the loose boats attached themselves to those fast to the whale, and all stuck their oars in the water, to retard its flight; but in vain: it reached the ice, and the men were obliged to pay away their lines until it stopped, which it did in a few minutes. The men, seeing it blowing, proceeded over the ice with three harpoons; two were stuck into it and the lances freely used, when it made off again, fortunately into clear water, where it was shortly killed. The ship, as usual, was anchored to the ice; the whale was brought alongside, and was flinched. It was a male fish, and miserably lean.

MALE.

6th.—Length of whalebone, seven feet and two inches.

During the time we were occupied in flinching, we perceived that the *Wellington* had got fast to a fish, and, from the length of time taken in killing it, supposed it to be a grown one.

29th.—Beautiful weather. Very nearly run foul of by a Dutch ship, which came so close that I could have jumped on board. It had got two small whales, and had their tails hung up in the rigging. No correspondence in language between us.

30th.—Quite calm, but thick foggy weather. Two ships with us, the Dutchman and a ship from Aberdeen. Great numbers of unicorns and seals around us, but could not take any of them.

31st.—Last night it began to blow from N.E., which drove the ice in large masses down upon us. As we saw no prospect of getting out, we looked out for and found a creek in one of the largest masses, into which the ship was taken. The sails were then stowed and the provisions got on deck, in the case of the ship being crushed to pieces. The ice continues to come down, so that no water can be seen, even from the mast-head. Prospect of getting out only by a change of wind or by being drifted to the southward. Nothing to relieve "the eye" but the bare masts of the Dutch and Aberdeen ships.

June 1st.—Wind N.E. Nothing can be more disheartening than our imprisonment.

2nd.—Early this morning the wind changed to the west. During the day the ice slackened considerably, and as it peeled off to the southward we occasionally caught sight of water. The Dutchman, being nearer the edge, soon got clear and out of sight. Some hours afterwards the ice near us began to move; a lane opened here and another there, and we set our sails ready to take advantage of any channel. We at last cast off, and threaded our way out between heavy floes, leaving the Aberdeen ship to follow, which was then a mile or two astern. Our way, when near open water, lay between two heavy floes. We got safely through, although we found the channel getting perceptibly narrower. Being then nearly if not quite safe, I went below with Capt. Dannatt; and while conversing, Mr. Ashe came down to inform us that the *Diamond*, in passing between the two pieces, had been caught by them and crushed to pieces. We ran on deck and found it too true. One of her masts was still upright; the others, with fragments of the vessel, were being piled up among the masses of ice which were broken off by the collision of the two floes. We approached as near as we could with regard to our own safety, although we dared not send them any help. We perceived that they had three boats on the ice, and were putting sails, chests, meat, &c., into them. Some of them at last launched one of their boats over the ice, and came on board of us. The party consisted of the captain, the surgeon, the mates, and several of the men. A signal was made to the others to come off, and one boat came, loaded to the water's edge with men and some of their effects. As about twenty still remained on the ice, boats were sent to bring some of them off, and to say that if they did not instantly come on board they would be left to their fate. They did then come on board, but most of them quite drunk and shockingly profane in their language. As the ice continued in motion, and was still very unsafe,

we got out of it as quickly as we could, leaving the remains of the *Diamond* and her eight whales. Capt. Small, in giving an account of the loss of his ship, said that in following our vessel he perceived that the channel between the floes was getting smaller, and lowered six boats to assist by towing. When, however, escape was seen to be impossible, the men in the boats, as well as those on board, escaped the collision by getting on the ice and out of the way. The men who were towing succeeded in dragging three of the boats on to the ice. Those on board got into the spirit-room before leaving. Some, and only a few, succeeded in saving a few of their effects.

Some Dutch ship being seen to leeward, the men who had last come on board requested to be sent to them. This request was readily granted, and two of their boats were given to them for the purpose ; and after the uproar and the disputes about the division of the things saved were settled, they went off, and the others to bed again. About three o'clock we got into a flock of whales. Six boats were instantly lowered, with strict orders not to separate. Two whales were immediately harpooned. In an hour and a-half one was killed and taken in tow by the ship ; and soon afterwards the second was killed, and also taken in tow. The boats then struck two others, which were killed without any unusual occurrence. The ship was then, as usual, anchored to the ice, and the whales were flinched.

7th.—Length of whalebone, seven feet.

8th.—Length of whalebone, four feet and nine inches.

9th.—Length of whalebone, six feet and ten inches.

10th.—Length of whalebone, six feet and four inches.

As the difference between day and night can only be distinguished by reference to the compass, and as the occurrences and events of the last two or three days have been so varied and so exciting, they are apt to get confused. I am, however, very decidedly entering the late occurrences on this morning of the 3rd.

3rd.—On this day we spoke the *Middleton*, of Aberdeen. Her captain came on board, and after a consultation it was decided that Capt. Small and a certain number of his men should go on board the *Middleton*. This was accordingly done, and Capt. Small left us with the sympathy of all on board. In the evening, quite calm. The weather being thick and foggy, the ship was made fast to a piece of ice.

4th.—Weather still calm and foggy. Caught a shark ten feet long, and hoisted it on deck for the purpose of examining its structure.

5th.—Still perfectly calm. The *Middleton* and the Dutch ship, with the *Diamond's* men, are in company. They had struck a whale for the Dutchmen, who are very anxious to keep them.

6th.—Gale of wind and hazy weather. Still anchored to the ice. Went on board of the Dutch ship, and was very hospitably entertained.

7th.—Got a channel out, and made way to the northward at noon. We were by obs. in lat. 80.12 N., and still making to the north.

8th.—At two o'clock this morning the *Trafalgar* arrived at the solid ice, which connects with the North Pole. After sailing some hours along its edge, in an easterly course, we bore away to the southward. At noon we were by obs. in lat. 80.44 N., and by Mr. Ashe's observation in 81.01 north. In the morning, before the ship bore away to the southward, it must have been ten or twelve miles farther to the north. At 7 P.M. we made the land, and continued to approach it.

9th.—At 7 o'clock this morning we were close in with Moffen Island, on the northern extremity of Spitzbergen, laying in 80.07 N., and coasted along during the day, with

a light breeze of wind from the N. N. E. This brought us again in sight of some of those magnificent wonders of creation, the icebergs, which have been so well described by one of our English poets, whose name I am unacquainted with:

> "So Greenland's rocks, the beauteous work of frost,
> Rise high in air, and glitter o'er the coast.
> Pale suns, unfelt, at distance roll away,
> And on the impassive ice the lightnings play.
> Eternal snows the growing mass supply,
> Till the bright mountains prop the incumbent sky.
> As Atlas fix'd each hoary pile appears,
> The gathered winter of a thousand years."

And in another part:

> "There might you see the length'ning spires ascend,
> The domes swell up, the widening arches bend;
> The growing towers like exhalations rise,
> And the huge columns heave into the skies."

At six o'clock P.M. we altered our course to the westward again, and at midnight got among light streams of loose and small ice, with here and there a heavy floe.

10th.—Strong breezes and clear weather. Boring our way to the westward with considerable difficulty, being often obliged to make a circuit to get round the floes or keep clear of them, so as to reach open water, the appearance of which we could see in the distance. About two o'clock we reached open water, which was formed by two very large and several smaller floes. The enclosed clear water was about a mile and a-half by a mile broad, and was literally swarming with whales, looking like droves of black cattle in a pasture. All the boats were lowered, with strict injunctions to keep together and not to strike more than three fish at one time. There was, of course, a contest, and a very sharp one—not who should strike the fish, but who

should do so first; for, besides the honor and credit, the harpooneer and stearsman of a boat first striking a whale receive each a guinea, and the rowers seven-and-sixpence each, independently of their share in the general profits of the voyage. Of course, the four loose boats are kept clear and ready to assist. Two of the boats pulled into a creek, and immediately each struck a whale. Another boat met a whale, and, although at disadvantage, succeeded in getting fast to it. By this time, two ships, the *Harmony*, of Hull, and the *Union*, of Peterhead, seeing our flags flying, arrived as we were killing our three whales. The boats of the Hull ship struck three fish; but for want of proper and timely assistance, one of them, with the six lines, escaped. The *Union's* boats struck two; but for the want of the aid of the other boats, one of them also got off, with their harpoon and lines attached to it. By this time the three whales we had struck were killed, and the men in the boats were busy getting in and coiling their lines, excepting Mr. Ashe, whose line had got foul of the bottom of the ice. As he was positive that it was a whale he was fast to, he did not strike his jack. While disputing about it, a whale rose not far off, and was espied by two of the boats belonging to one of the other ships, who, however, would not strike it, as they saw a harpoon sticking in its back, and Mr. Ashe's jack flying not far off. Capt. Dannatt, who witnessed the circumstance, immediately called one of our boats; but as their lines were not quite coiled in, it did not come for a few minutes, and by that time the whale had gone. Capt. Dannatt, however, who was in the crow's-nest, observed its course, and directed the boat to lie at a point which he pointed out. The boat had only lain there a few minutes when the whale rose at a short distance and was instantly struck, and, with the assistance of some of the other boats, which by that time had got in their lines, was soon killed. When brought alongside it was found to be the whale which had escaped from the *Union*, as one of that ship's harpoons,

with six lines, was attached to it. By the time this last whale was killed, hardly a fish was to be seen: all had taken fright and disappeared.

11th.—At two o'clock this morning the ship was anchored to the ice as usual, and the four whales were brought alongside and flinched.

MALE.

11th.—Length of whalebone, eight feet and three inches.

MALE.

12th.—Length of whalebone, eight feet and four inches.

MALE.

13th.—Length of whalebone, six feet and one and three-quarters inches.

MALE.

14th.—Length of whalebone, eight feet and four inches.

During the time the crew were employed in cutting up the whales we were visited by several sharks, and I again availed myself of the opportunity of dissecting one of them. They are most torpid and senseless animals; for, though a knife or a lance is run into them, they retreat a few yards, but directly return again. After the whales were flinched and the decks cleared and cleaned, the ship was cast off, and proceeded to look out for the passage again, but found it effectually blocked up.

12th.—Very thick and foggy; no egress, and the space in which we are confined is evidently less. At noon, saw a small whale and sent boats after it. One boat got near it, but not near enough to strike, and the harpooneer hove his harpoon at it, but did not get fast. Soon afterwards it rose again near one of the boats, and the harpooneer struck at it with such force as to bend his harpoon almost double; but, to his surprise, the man found the weapon remaining in his hand. He had struck it on the crown-bone. Soon afterwards it was struck and killed by the boats of the *Harmony*. Ship still anchored to the ice.

13th.—Weather still thick and foggy—so much so, that objects cannot be perceived beyond the length of the ship. As the space of water in which the ship is confined gets less,

we are obliged to cast off and choose another berth. During the evening the weather cleared up a little, and we found ourselves surrounded by unicorns, but could not succeed in striking one of them. The *Harmony*, however, got one by shooting it with a gun-harpoon.

14th.—Weather still thick and foggy; no egress, but the basin in which we are confined apparently gets larger. To-day, got again two sharks: neither of them had eyes. The sockets remain, but the eye-balls appear to have been taken out, as the remains of the muscles are still to be seen. The cavity of the brain is very small, hardly larger in circumference than the spinal-marrow. They are, consequently, very tenacious of life. The head of one was cut off, and retained its sensibility for a long time. A fishing-lead was put into its mouth five hours after, and it bit it through with ease.

15th.—Still thick and foggy. The ice has opened; but, on account of the fog, it was thought unsafe to cast off,—so we remain anchored to the ice.

16th.—Still very foggy, and anchored to the ice.

17th.—Quite clear, and fine mild weather. Perceived some vessels coming towards us, and made off to the N. W. with the intention of leaving them and keeping by ourselves. Only one followed us. After sailing eight hours, we came to two heavy floes with a clear passage between them; we ran down, leaving the other ship, which would not follow us. After sailing along the edge of one of the floes for three or four miles, Capt. Dannatt perceived a whale blowing in a hole in the floe. Two boats were sent to the edge of the ice, and one of the harpooneers was directed to proceed over the ice to the hole, and to wait there until the fish appeared again. He went with two of the men dragging the line, and found the whale still lying there. He at once plunged his harpoon

into it, with such force as to overbalance himself and fall into the water. He was with difficulty extricated by the two men who had accompanied him. The whale made into the open water, and was killed in an hour and a-half. While the boats were towing it on board, another whale rose close to them; it was instantly pursued and struck, and in thirty-five minutes was killed. It was only a small one. When the whales were brought alongside, it was perceived that the floes of ice were coming together, under the influence of a current. The whales were immediately cast-off from the ship, and six boats left to tow them; while all sails were set to beat out again. In two hours we had weathered a point, where we considered ourselves safe, and then lay-to for the boats. As it was, we had little time to spare; for if we had not seen the ice in motion when we did, or if we had been a mile more to leeward, we would have shared the fate of the *Diamond*. We watched the two enormous pieces come in contact with a horrible crushing noise, and saw the fragments piled up to a great height. *X mem. ex.*

18th.—At two A.M. the boats with the two whales joined the ship, and the usual process was gone through.

MALE.

15th.—Length of whalebone, seven feet and four inches.

FEMALE.

16th.—Length of whalebone, three feet and eight inches.

At ten A.M. spoke the ship we had seen the day before, the *Mary and Elizabeth;* and as it became foggy, the master came on board and spent the day. In the evening the weather cleared up, and, as the ice appeared to be closing, we tried to get into an adjoining body of water, but were prevented by a piece of ice twice as big as our ship, which blocked up the only channel. Twelve boats were sent—six from each vessel—to attempt to tow it out of the way. In half an hour they succeeded in making a passage sufficient to allow us to pass through, which we did without damage. The *Mary and Elizabeth*, however, struck one of the sides of the passage, and, recoiling, got jammed fast; and it was only after considerable exertions that she was towed clear. Soon afterwards we saw a whale, and pursued it; but the weather becoming foggy again, the boats were recalled.

19th.—Uncommonly thick and foggy, with very little wind. Early this morning the watch on deck heard repeated calls of "A fall! a fall!" and could distinctly hear the whale-lines running out of a boat, but could see nothing. As all of our ship's boats were on board, we paid no attention to the calls. When another watch came on deck, half an hour afterwards, the harpooneer in charge heard a whale blowing near the ship, and sent two boats after it, but too late. In a short time a boat belonging to the *Mary*

and Elizabeth came on board, and told us that they had left their ship in pursuit of some unicorns, but, coming across the whale, had harpooned it, and lost it for want of assistance. As they could not find their vessel in the dense fog, they remained on board with us until it should clear up, which it did in a few hours after. During the day we heard the blast of whales, but could not see them for the fog.

20th.—This morning a polar bear appeared near us, on the edge of the ice. He was supposed not to be hungry, as he did not attack us or get into the water, and none were hardy enough to attack him on the ice. After looking at each other for some time a fog supervened, and we saw him no more. In the evening it cleared up, and we found ourselves surrounded by unicorns. Boats were lowered; one of the boats, perceiving three approaching, lay perfectly still on the water, the harpooneer ordering the men to lift their oars out of the water and to be perfectly silent. There were a male with a long horn, a female, and a young one. On nearing the boat the male perceived it, and made off. The female was following, when the harpooneer threw his harpoon, and fortunately with success. It ran two lines out, and on coming up was killed by the other boat. It was brought alongside and hoisted into the ship entire. The mouth, throat, and stomach were full of different kinds of small animals and fishes—the greater number like overgrown shrimps; some of them measured four or five inches in length. The unicorn itself was sixteen feet long, and yielded one butt of oil. At nine P.M. made sail to the northward, the current having carried us considerably to the S.W. Parted with the *Mary and Elizabeth*, who preferred remaining behind.

Early this morning, being at the masthead with one of the spiksoneers, he directed my attention to two objects on the ice, at some distance. As they advanced rapidly towards us, we soon perceived them to be two polar bears—an old one

and its cub. We called out to those on deck, and two boats were manned and lowered, with Capt. D. in one of them. As soon as the bears perceived the boats they got into the water, and swam towards them with astonishing rapidity. When near the boats Capt. D. fired at the old one, but with no apparent effect. He fired again, when the bears turned and made towards the ice; they scrambled up and stood on its edge, shewing no inclination to renew the attack; the boats got closer to them, when Capt. D. fired again, and shot the dam through the head. The young one would not quit the body, but remained until a noose of a rope was thrown over it, and it was dragged into the water, as Capt. D. wished to keep it alive. It was five feet long, and stood higher than a large sheep; when brought alongside, it shewed such ferocity that it was decided to kill it. I found their stomachs perfectly empty. The white bear is very ferocious, and, I am told, very rarely turns tail, as this one did, when wounded. Innumerable stories are told of their attacking the boats. Last season, Captain Hawkins, of the *Everthorp*, of Hull, attacked a bear in the water; his gun would not go off, and he attempted to run his whale-lance through it as it advanced; the lance, however, struck on its breast-bone, and the bear, wrenching it out of his hand, got into the boat, and seizing him by the thigh, made off to the nearest ice. The men were paralyzed for a minute or two, when they followed the bear, throwing the loose articles in the boat at it; one of them hitting it on the head, it left hold of the captain and followed the boat, which, taking a turn, picked up the captain and took him on board.

Some years ago a bear was attacked by a boat, and in trying to get into the bow the harpooneer cut off one of its paws with his axe; it then got into the stern of the boat, when the boat-steerer jumped overboard; it then cleared the boat, of which it held possession until it was shot, the men, in the meanwhile, hanging on in the water by the oars.

During the day we saw several whales running to the N. W., but could not get near enough to any of them to strike.

23rd.—Early this morning, while coasting along the edge of a floe, saw several whales running in the same direction to N.W. as yesterday, and sent six boats after them. For upwards of six hours they were unsuccessful. At last a boat laying at the floe's edge perceived two whales coming towards them, and as they passed, the harpooneer threw his harpoon at one of them, and got fast. It was killed without any particular occurrence. The ship, as usual, was made fast to the edge of the floe. The whale was then brought alongside and flinched.

MALE.

17th.—Length of whalebone, six feet and four inches.

When finished, stood to the westward, as that was the course taken by the whales.

24th.—Still sailing to the westward. No whales seen.

25th.—Stood to the westward until we were stopped by the ice. We saw no whales, but passed several bears. Got through an opening in the ice, and bore away to the northward.

26th.—Quite calm, and warm weather. We saw two bears on the ice, and sent a couple of boats after them. We lost sight of one of them entirely; the other kept ranging about without perceiving or noticing the boats. After we had left the ship, six of the men, more foolhardy than the others, insisted on attacking it on the ice. They armed themselves with harpoons and whale-lances, and set off, leaving one man in their boat. They had proceeded 150 or 200 yards with great difficulty, on account of the depth and softness of the snow, as well as of the great inequalities of the ice, when the bear either saw or smelt them. At any rate it stopped and turned round, and looked full at them. Whether it was that they did not like its looks, or that their courage failed them, but with one consent they turned tail, and made for the boat, tumbling down every few steps; and although the bear paid no attention to them, but was making towards the other boat, they did not stop to see whether its head or tail was towards them until they were safely on board of their boat. In the meanwhile the bear was making his way to the boat in which the captain and I were waiting for him. When he got to the edge of the ice he took to the water, and swam rapidly towards us. When at a short distance, Capt. D. fired at it, and the ball went through its body. It at once turned about and got on the ice, where it rolled over and over, and clapped snow on the wounds in its sides, growling all the while. At last it again got into the water and made towards us. I fired at it, but the gun would not go off, having got wetted with the splashing of the oars. Capt. Dannatt then ordered the boat to be rowed very rapidly past it, and at the moment of passing he thrust the whale-lance through its body; it still swam after us with astonishing rapidity, particularly when the nature of its wounds are considered. However, not being able to get near us, it stopped and tried to get the whale-lance out of its body; it failed, but gnawed the stock in pieces. The boat was again rowed quickly past it, and another lance thrust into it. It then, with great

difficulty, got upon a piece of ice, and crawled to the other side, very evidently with the idea of escaping. It lay on the ice growling at us until it died. In the afternoon a breeze sprang up, and enabled us to pursue our way to the N.W.

27th.—At midnight several whales were seen, and, after many fruitless attempts, a harpooneer struck one of them; it went down, and remained about an hour, when it came up. No boat dared to approach it, as it kept one of its fins menacingly in the air. A harpooneer threw his harpoon at it, and fortunately got fast, but had his boat injured by a blow from its tail. When the whale rose again, it again struck at one of the boats with its tail. The blow fortunately fell short of the boat, but struck the oars on one side, making them fly up in the air. One of the men was hurt by the springing of his oar. In two hours more it was killed. The ship was made fast as usual, the whale brought alongside, and got on board as usual.

MALE.

18th.—Length of whalebone, seven feet and eight inches.

At 7 in the morning the decks were cleared, when two whales were seen. Six boats were sent after them. One was struck and killed in three hours; and after being got on board in the usual manner, the ship was cast-off, and beat towards the head of the floe.

MALE.

19th.—Length of whalebone, seven feet and four inches.

28th.—At three this morning we got to the head of the floe, and saw several whales, and sent six boats in three parties. Two of the boats, while lying at the edge of the ice, perceived a flock of unicorns coming towards them. One of the harpooneers threw his harpoon at one, and struck it; it was soon killed, and was taken to the ship. During his absence his comrade saw three whales coming towards him, and struck one, but for the want of assistance was obliged to let it go, after it had run all his lines out. About the same time a whale was harpooned by one of the other boats, and soon killed; but before the five boats had secured their lines, a barrier of pieces of ice came down and beset them. As this barrier was about a mile and a-half broad, we on board had very serious apprehensions for their safety and for the loss of the whale. The ice continued to come down till six o'clock in the evening, when it peeled off again as rapidly as it had come down; and in an hour and a-half more the boats and the whale were liberated, after an imprisonment of 15 hours. As soon as they were free, and whilst returning to the ship, they met a young whale, and very soon killed it.

20th.—Length of whalebone, eight feet and eight inches.

21st.—Length of whalebone, three feet.

29th.—Strong breezes, and hazy.

30th.—Quite calm and warm, but still hazy.

July 1st.—Strong breezes. The ship still anchored to the ice. Sent the boats after two whales, but without success.

2nd.—Ship still anchored to the floe.

3rd.—To-day, killed a very large bear, and handed his skin to the sailors to be footed. Ship made out to sea, intending to get to the northward.

4th.—In open sea, and proceeding to the northward. In he evening, fell in with two Dutch ships, clean.

5th.—Stood into the ice again. No whales to be seen.

6th, 7th, and 8th.—Thick and foggy; weather quite warm.

9th.—Made fast to a floe for the purpose of filling our fresh-water casks from the ice. As one of the boats was leaving the ship, the steersman broke his oar in pushing off, and fell into the water; as the boat had way on at the time, it went a short distance ahead; on returning, owing to the unskilfulness of the man who undertook to steer, the harpooneer could not reach him, and he sank. He saw him under water, and tried to get hold of him with a boat-hook, but failed. He was a fine young man—a native of Berwick, and 22 years of age.

11th.—Being nearly full, Capt. Dannatt determined to abandon any further attempts to capture the whale, and to proceed homewards.

13th.—Were surrounded by the remains of a wrecked vessel—loose spars, companion-doors, &c.; among them was a topmast with the name "*Rover*, of Bristol"; but as no Greenland-man of that name sailed out of Bristol, or out of any British port, it was supposed to be some merchantman who had been driven out of her course and perished among the ice. Among the floating wreck was one piece very suggestive; it was a substitute for a rudder, made out of a topmast and jibboom, with spars fastened across by copper nails, long pieces of iron, ships' bolts, wooden trenails, and rope. It was attempted to be weighted down by seven fathoms of chain-cable. In the evening, got into a stream of ice, on which were immense numbers of seals, but failed to take them.

17th.—Very nearly captured a very large sea-horse, which we found asleep on a piece of ice.

19th.—Were surrounded by immense shoals of herrings, swimming close to the surface of the water, and causing it to present a very peculiar appearance. We tried all sorts of plans to take some, but failed. A number of bottlenoses—"*Balæna-Rostrata*"—accompanied them, and seemed to be more successful. In the evening a gale came on, and blew with great violence from N. E., which drove the ship at the rate of nine knots, with a close-reefed fore-topsail.

20th.—The gale continues with less violence. In the evening a man on deck declared he saw land, and was heartily laughed at for the idea. A few hours later, however, the weather cleared up, and discovered us close in to Trinity Island, at Jan Mayen, from which we supposed ourselves to be far distant. A very few hours' continuance of the foggy weather would have reduced the *Trafalgar* to the condition of the *Rover*, of Bristol, whose remains we saw a week ago. The ship was immediately close-hauled, and stood to the eastward, giving Jan Mayen what the seamen call "a wide berth."

29th.—We got among great quantities of sea-weeds, herbage, star-fish, &c., indicating our vicinity to land. The nights now are an hour and a-half long.

30th.—Calm. Surrounded for the first time by numbers of large dark-coloured birds, called boatswains by the sailors, from two long, stiff, and sharp-pointed feathers, which form the tail, and give the resemblance to a marlin-spike. They seem to be regular pirates. They do not fish for themselves; but when they perceive any other bird with a fish, they pursue, and do not cease tormenting it until it drops the fish, which they generally secure before it drops into the water.

From this time until our arrival in Shetland, on the 7th August, the *Trafalgar* was generally in soundings, and I

caught abundance of mackerel, coal-fish, cod, and ling. Our stay in Brassa Sound was merely long enough to enable the agent to pay off our Shetland-men. We then proceeded to Hull, where we arrived on the 21st of August, without any particular occurrence.

PAPER III.—HISTORIC MEDALS OF CANADA.

BY ALFRED SANDHAM, OF MONTREAL,

Author of the "Coins of Canada," "Montreal, Past and Present," &c.

(*Read before the Society, April 9th, 1872.*)

MAN is said to be a hunting animal. Some hunt for foxes; others for fame or fortune; others hunt in the intellectual field; some for the arcana of nature and of mind; some for the roots of words, or the origin of things. "I am fond of hunting out a pedigree;" so writes Mr. Lowe, in his introduction to the *Curiosities of Heraldry*. While I can, to a great extent, appreciate Mr. Lowe's love for the study of heraldry, I must admit that to me the hunt after medals and coins possesses far higher pleasure, and an ever-increasing interest gathers about the study of numismatics. The very act of tracing up historical events commemorated by medals and coins, or of studying the character of the men whose deeds of valor are thereon recorded, when once systematically undertaken, "leads the student through the most interesting region of historical romance."

The popular idea of a numismatist is that of a man who very foolishly wastes both time and money in gathering a quantity of old coins or medals merely for the satisfaction of being able to say that he "has a collection." It is not uncommon to dispose of many things precisely in the same manner, when an opinion is formed without even the slightest attempt to judge of a question by its true merits. "A map has no value to those who ignore geography. The claims of archæology are disregarded by all who are content to remain in ignorance even of what it implies." In like manner, the study of numismatics appears under a different aspect to those who know it only by name, and to lovers of biography and history, who are familiar with its lucid and yet ever-suggestive guidance. To the genuine student in this field every coin or medal in his collection opens a new subject of thought, and it is no idle employment

to trace its history. Aside from their value as *incentives* to Historical research, there remains the fact that medals and coins have *preserved* more than any other monuments the history of the past. "If all our historians were lost to us," says Gibbon, "medals and inscriptions would alone record the travels of Hadrian."

Medals in particular must ever afford delight to collectors. Novelty and beauty, our two great sources of pleasure, are well supplied by them. It is the thirst for novelty that makes man so curious in his researches into antiquity; and hence arises the pleasure derived from medals, "displaying, as they do, the faces and forms of persons with whom history has made us so familiar, that we long to see the shapes and aspects of the bodies they inhabited, and the faces on which their minds and characters were impressed."

In like manner, we are delighted with the representation of the battles, honors, dresses, and other interesting circumstances belonging to them. The beauty of medals will also give additional zest to the pleasure afforded by them—a pleasure which is enhanced in proportion as the mind and imagination are refined and vigorous.

The French (above every other modern nation) have been distinguished by a love for the numismatic art. The monarchs of that nation have employed the mint to give dignity to their successes in arts and arms; and all events worthy of notice are found recorded on their medals. To this source we are indebted for the deeply-interesting medals which I shall describe in the first division of this paper. In bringing before you a few pages of Canadian history, which have been perpetuated by the issue of medals, I may state that it is probable much may be written that is familiar, still nothing is referred to beyond that which is indispensable to the proper connection of the events noted, and I trust that the medals exhibited (many of which are rare and valuable) may serve not only to please, but to instruct.

It cannot fail to interest the members of the Literary and Historical Society when they learn that the earliest Canadian historical medal is that struck by order of Louis XIV., to commemorate the defeat of Sir Wm. Phipps, the would-be-conqueror of the "ancient capital." It is true we have a private medal of Chevalier de Levis, viceroy in Canada in 1644; but beyond the fact, that by letters-patent dated Nov. 1644, he was named a viceroy and lieutenant-general of the French possessions in America, there is but little of special interest attached to the medal. Abbé Ferland informs us that the De Levis family claim for themselves a direct descent from the Patriarch Jacob by his son Levi; and in a family-chapel there is a painting representing the Virgin Mary in conversation with a member of the Levi family, who stands holding his hat in his hand. The inscription explains the picture: "Couvrez-vous, mon cousin," says the virgin. "C'est mon plaisair, ma cousine," responds the descendant of Levi. The medal is however a beautiful work of art, and will always form a valued addition to a cabinet of medals.

I shall now proceed as rapidly as possible to the historic events which may claim attention.

Until the extension of the British settlements in the now United States, Canada enjoyed an almost uninterrupted tranquillity. When M. de la Barre arrived as Viceroy, in 1682, he found that the English, by the payment of more liberal prices for furs, had succeeded in drawing away a great portion of the French trade, and that the Iroquois were even purchasing from the Huron allies of the French and selling again to the English. At this interference with what had hitherto been a monopoly, the French felt greatly incensed, and efforts were made to stop the trade. The attempts made proved worse than a failure: it incensed the English and their Indian allies, and for years the French settlements were kept in constant agitation and alarm. It became apparent to the French Government that there should be appointed, as

Viceroy, one whose influence over the Indian tribes might once more regain their friendship; and accordingly, to meet the emergency, Count de Frontenac, who, during a former official sojourn in the country, had won the love and respect of the several tribes, was in 1689 re-appointed Viceroy. Under ordinary circumstances he might have succeeded in his mission; but war was declared between France and England, and the Iroquois wisely foresaw that their interests lay with the English settlers, and, therefore, allied themselves to the strongest side. Incursions were now made by the French into the English settlements, and with such secrecy that the unsuspecting inhabitants of many villages and towns were taken prisoners, or massacred without an opportunity for defence.

The people of New-England and New-York, feeling that their safety depended upon the removal of such troublesome neighbors, determined to drive the French out of Canada altogether; and preparations were accordingly made to effect this object. Expeditions were despatched to reduce Quebec and Montreal. The former, comprising 34 ships and 2000 volunteers, under command of Sir Wm. Phipps, sailed from Boston on August 19th, 1690, reaching Quebec, October 16th. Count de Frontenac had but three days before received warning of the departure of this expedition from Boston, and the preparations for defence had to be hastily performed.

Sir Wm. Phipps, immediately on his arrival, sent a summons to surrender. His messenger was so completely surprised by his reception, and the ceremonies through which he was compelled to pass, while blindfolded; that when he appeared in presence of the sturdy old Governor, some considerable time elapsed ere he sufficiently recovered from his embarrassment to enable him to present his summons with the dignity he so naturally considered as necessary to the importance of the occasion. The reply given by the Governor was such as might have been expected in answer to the

arrogant terms laid down by Phipps; and when the messenger asks for a written answer, the Count rejoins: "Retire, sir; tell your General that the muzzle of my cannon will forthwith bear my answer to the rude summons he has sent me." True to his word, the orders were given, and the batteries opened upon the fleet with telling effect. Sir Wm. sought, by stratagem, to gain advantages over the enemy; but he signally failed, and finally retired from the conflict, having lost many of his men, and leaving his artillery (which he had landed) as a prize to the French. Such is a brief account of the circumstances which are commemorated by the medal, known to numismatists as the "Kebeka Liberata," and which was prepared by order of Louis XIV. immediately on receipt of intelligence of the defeat of the English. The medal bears on the obverse the head of Louis, with the inscription: "Ludovicus Rex Christianissimus." On the reverse France is seen seated upon a ledge of rocks (typifying Quebec), and surrounded by banners and armor; by her side is a beaver, and in the background a number of pine trees; while at the base of the rock is seated a male figure, intended to represent the River St. Lawrence. The inscription, "Francia in novo orbe victrix," surrounds the upper portion of the medal, while the exergue completes the significance of the design and inscriptions, by bearing the words, "Kebeca Liberata, M.DC. XC."

Volumes have been written wherein are recorded the engagements which took place between the two nations during the war which was terminated by the peace of Ryswick, 20th September, 1697, and the subsequent hostilities during the war of Queen Anne (declared 1702). The events of these wars more particularly affecting the tranquility of Canada, took place in the neighborhood of Newfoundland, Nova Scotia, and the Island of Cape Breton. Passing onward to the year 1711, we find that "an agent was despatched (by the British Government)

to Paris, with proposals for a peace, which proved very acceptable to the French Government. In the following year a suspension of hostilities was signed, and negotiations for a general peace were commenced."

During these negotiations the French made great exertions to recover Acadie, which had been taken, and they offered in exchange the valuable fisheries of Newfoundland and other posts; but the offer was rejected. In 1712, under date May 24th, a proposition was made, on behalf of Queen Anne, "That the subjects of His Majesty (Louis XIV.) should enjoy, in common with the Queen's, the island of Cape Breton, and that the islands in the Gulf of St. Lawrence and in the mouth of the river of that name, which are at present possessed by the French, should remain to his most Christian Majesty, but expressly upon the condition that his said Majesty shall engage himself not to raise or suffer to be raised any fortifications in these islands or in that of Cape Breton; the Queen engaging herself, likewise, not to fortify, or suffer any fortifications to be raised in the adjacent islands and those next Newfoundland, nor in that of Cape Breton." To this article the French King naturally demurred, and claimed his rights of the privilege of erecting such fortifications as he might think necessary for the protection of the island of Cape Breton, which he maintained should belong exclusively to France, and not to be occupied in common with the English, as was demanded; and at the same time he conceded that it was "just that the Queen of Great Britain should have the same liberty to erect what fortifications she will think necessary, whether in Acadie or in the isle of Newfoundland." Finally, by the Treaty of Utrecht, signed on April 11th, 1713, it was agreed "that the Island of Cape Breton, as also all others, both in the mouth of the river St. Lawrence and in the Gulf of the same name, shall hereafter belong of right to the King of France, who shall have liberty to fortify any place or places there."

Cape Breton being now the only point along the whole Atlantic coast of North America which remained to France, it became an object of the first necessity to that nation to construct a fortified naval station on that island. The garrison and inhabitants of Plaisance were immediately removed to Havre a l'Anglois (Louisbourg), which was favorably known as suitably situated for carrying on the fishery. Beyond its favorable situation there was at that time little said on behalf of this place, and several years elapsed before the French Government came to the decision to erect fortifications there. When the decision was finally taken, "the name was changed to Louisbourg, in honor of the King; and, to mark the value set upon the island of Cape Breton, it was called Isle Royale."

Nothing worthy of record occurred at Louisbourg after its foundation until the year 1720, when the fortifications were commenced. The importance of this work is clearly shewn in the fact that it was deemed worthy of commemoration by the striking of a medal by order of the Government. This medal bears on the obverse a bust of the King, and the inscription: "Ludovicus XV., D.G., Fr. et. Nav., Rex—(Louis XV., by the Grace of God, King of France and Navarre.) On the reverse is shewn a plan of the fortifications of Louisbourg, with vessels before the city; the inscription being "Ludovicoburgum, fundatim et munitum M.DCC.XX."

"From this time the population began to increase rapidly by the arrival of officers, mechanics, and laborers; while the people of New-England speedily availed themselves of the valuable market offered for their surplus produce." For twenty years the French Government devoted all its energy and resources to the completion of the fortifications; and even the English colonists contributed a great proportion of the material used in their construction. The fortifications were very extensive and formidable, and, indeed, considered impregnable. In the circuit of the walls there were

embrasures for 148 guns. The principal entrance to the town was through the west gate, over a draw-bridge, covered by the guns of two batteries; and access from the land-side was equally difficult. Between the year 1720 and 1745 the enormous sum of £1,200,000 sterling was expended, and the fortifications were still unfinished.

The tranquillity which pervaded the colonies after the Treaty of Utrecht, was terminated by the war entered upon in 1744. Immediately upon the declaration of war, the French despatched information thereof to Louisbourg, and the Governor at once prepared to attack the English settlements in Newfoundland. It is said that in this matter he acted without orders from the Government; nevertheless, his action undoubtedly hastened the decision of the British to reduce Louisbourg. When the plan for the first attack was laid by Governor Shirly before the General Court of Massachusetts, the strictest caution was enjoined upon the members, and the question was discussed under an oath of secrecy, lest its purport might reach the enemy's ears. For several days it was kept secret; but a pious old deacon, a member of the Legislature, having been heard invoking the favor of Heaven upon the enterprise, at his devotions, it soon became public, and excited astonishment at its audacity. Notwithstanding the boldness of the scheme, it was successfully carried out, and, after a siege of over six weeks, Louisbourg surrendered to Sir Wm. Pepperel. The conquest, which was achieved at the expense of many valuable lives, proved of but little service to the English. The fifth article of the treaty of Aix-la-Chapelle, signed April 30th, 1748, having provided for the restoration of all conquests, without any exception.

Eight years later war was again declared; and when, in December, 1757, the British Parliament met, the King declared his intention to protect the rights of his crown and subjects in America, and that active measures should now

be taken to effect the conquest of Canada. To accomplish this great object, the reduction of Louisbourg was decided upon. For this enterprise a combined naval and military force was organized, under command of Admiral Boscawen and General Amherst. With this, the second siege of Louisbourg, commenced an era in the history of Canada which has been largely commemorated by the issue of medals, some of which are very beautiful, and each specimen possessing great attractions to the Canadian numismatist.

On May 28th, 1758, the fleet under Boscawen sailed from Halifax for Louisbourg. It numbered in all 157 sail, of which 118 were transports conveying the land force of 12,000 men. General Amherst arrived from Germany in time to join the squadron at the mouth of the harbour. It is not necessary to trace the siege to its successful termination. On the 26th July, 1758, the articles of capitulation were signed, and Louisbourg forever passed from the hands of the French Government; and that power received the most effective blow of the war, losing its main depot for the support of its army in North America.

Prominent among the officers who took part in the siege was one whose name will ever occupy a conspicuous place in the pages of Canadian history, James Wolfe, who was one of the first to leap on shore and scale the cliffs. His detachment consisted of about 2000 men, and his instructions were to proceed around the northern harbour and attack a projecting neck of land commanding a small island-battery which gave considerable annoyance to the besiegers. He successfully accomplished this, and erected a battery which commanded one of the most important outposts of the enemy. Recalled to the front, he bravely took part in the most important attacks; and wherever there was difficulty or danger, Wolfe was in the foremost rank. Such was the character of the General to whom was now entrusted the command of the expedition about to be despatched to attack Quebec.

The attack upon and surrender of the "Gibraltar of America," with the loss of the gallant leader, are facts "familiar as household words," and need not be here repeated. After the capitulation the British troops encamped around the city till quarters could be found within the walls, and the commanders quietly awaited the passing of the winter months. The plan of action for the campaign of 1760, decided upon by the British Government, provided for the reinforcement of the Quebec garrison, which was to be increased sufficiently to proceed under command of General James Murray to attack Montreal; General Haviland had orders to assemble his troops on Lake Champlain and force a passage towards the point indicated; finally, General Amherst was to assemble a numerous army at Oswego, and, descending the St. Lawrence, join the two other corps before Montreal. Notwithstanding efforts made by the French to thwart these plans, they were successfully carried out. On the 6th September, Amherst's forces landed on the island to the west of the city. On the 7th, Murray and his troops disembarked, and took up their position to the north-east; and on the following day Haviland arrived with a force of 3000 men; and thus, an army of nearly 16,000 men were assembled before the city. To such an overwhelming force resistance was useless, and on the 9th of September Vaudreuil signed the articles of capitulation which severed Canada from France.

It was but natural that the daring deeds performed, and the successes achieved during those memorable campaigns, should attract the attention of the medallists of the day; and we accordingly find nearly a score of these metallic mementoes, on which are depicted the battles which were fought, and in some instances portraits of the Generals under whose command the armies gained such victories. These medals may be divided into three distinct classes; 1st, those which commemorate the capture of Louisbourg only;

2nd, the capture of Quebec and Montreal; and 3rd, medals which, while commemorating both of these events, also refer to engagements in other parts of the world.

Of the first series there are seven medals, as follows:

1.—Obverse—A globe, on either side of which is a soldier and sailor, who point to the portion marked Canada; above is Fame blowing a trumpet, while the figure of France lies prostrate beneath the globe. Reverse—A naval fight, with the Louisbourg fortifications, &c.: "Louisbourg taken, 1758."

2.—Obverse—Head of Britannia: "O, fair Britannia, Hail!" Reverse—Victory marching. Same inscription as No. 1.

3.—Obverse—Similar to No. 1. Reverse—Victory standing upon the prow of a war-vessel, and holding a crown; the inscription being the same as No. 1.

4.—Obverse—Head as on No. 1, with names of "Boscawen, Saunders, and Wolfe." Reverse—Same as No. 2.

5.—Obverse—Bust of Boscawen in armor: "Admiral Boscawen took Cape Breton." Reverse—A view of the siege of Louisbourg: "Louisbourg, July 26, 1758."

6.—Obverse—Bust in naval uniform; otherwise, same as No. 5. Reverse—Similar scene to that depicted on No. 5, but reversed in position.

7.—Obverse—Bust of Boscawen in armor: "To brave Admiral Boscawen." Reverse—The French commander kneeling before Boscawen and surrendering his sword: "I surrender prisoner, 1758."

Of the second series there are five types, as follows:

1.—Obverse—Bust of General Wolfe to right: "Jacobus Wolfe Anglus." Reverse—An urn upon a pedestal surrounded by military trophies: "In victori cæsus Quebecæ, Sept. XIII., M.DCC.LIX., pro patrea."

2.—Obverse—Head of Britannia between a trident and standard saltiere-wise, and bound by a wreath: "Saunders, Wolfe." Reverse—Victory crowning a trophy, a captive bound: "Quebec taken, 1759."

3.—Obverse—A laureated male figure reclining with right arm on the prow of a Roman galley; the left holding a paddle; a beaver at his feet; in the back-ground is a Roman standard surmounted by a lion, and inscribed, "Amherst." In exergue—A shield, bow, battle-axe, and quiver of arrows: "The conquest of Canada completed." Reverse—A female seated weeping beneath a pine-tree; before her a shield charged with fleurs-de-lis; behind her an eagle ready to fly from a rock. In exergue—"For promoting arts and commerce." Above—"Montreal taken, 1760."

4.—Obverse—Bust of George II. to left: "Georgius II., Rex." Reverse—Same as No. 3: "Canada subdued, 1760."

There are doubts as to the origin of the fifth medal of this series. The only known specimen is now in the collection of Mr. I. F. Wood, of New York. It is composed of a soft metal, resembling lead, and bears upon the obverse a view of Montreal with its walls, above which appears the word "Montreal." In an oval depression below are the letters "D.C.F." The reverse has engraved near the top the word Tankalkel, (?) and in the centre, in Roman letter, "Mohigrans." Mr. Wood writes to me that he has but recently heard of another variety of this medal with the name "Onondagos" in lieu of "Mohigrans." Considerable mystery attaches itself to these medals, and well-qualified authorities have expressed doubts as to their authenticity as *struck* medals.

Passing on to the third series, we find but four varieties; indeed, we may say there should be but two named, as the

others are what are familiarly known as mules, being formed by using alternately the obverse and reverse dies of the first two to be noticed:

1.—Obverse—Laureated bust of George II. in armor: "Georgius II., Rex." Reverse—In centre a shield charged with an inverted fleur-de-lis, and surrounded by a garter, inscribed, "Perfidia eversa;" the whole supported by a lion and unicorn. The ribbon below the arms is inscribed, "W. Pitt, ausp. Geo. II., Pr. Mi." Immediately above the arms, "Hawke Quiberon, November 20;" and over this is a shield, "Quebec, Wolfe, Monk'n, Towns'd, Sept. 13, 18." Under the arms, 1759; and in a shield, "Minden Ferdinand, Aug. 1." On the right of the arms, "Crown Point, Amherst, Aug. 4; Lagos, Boscawen, Aug. 19;" to left, "Guadalope, Barring'n, Moore, May 1; Niagara, Johnson, July 25."

2.—Obverse—Britannia seated in a chariot drawn by a lion, and supported by Liberty and Justice. The ground on which the figures stand is studded with *fleurs-de-lis*. On a ribbon is inscribed, "Foedus—invectum;" below, "1758." Round the medal, in two lines: "Senegal, Mai 2; St. Malos, Jun. 16; Cherbourg, Au. 16; Louisbourg, July 27; Frontec, Aug. 27; Duquesne, Nov. 24; Gorree, Dec. 29; Marsh, Mason, Marlboro, How, Boscawen, Amherst, Bradstreet, Forbes, Keppel." Reverse—Same as No 1.

3.—Obverse—Same as reverse of No. 1. Reverse—Same as obverse of No. 2.

4.—Obverse—Same as No. 1. Reverse—Same as No. 2.

Without exception, the medals of these three series are very scarce; indeed, specimens of Nos. 2, 3, and 4, of the first series, have not been met with in Canada; and the only specimen of No. 7 is that in my possession (now exhibited).

For fifteen years subsequent to the conquest nothing transpired to call forth the artist's skill; but at the termination

of those years the American invasion disturbed the peace of the colony and demanded the services of the inhabitants.

Nobly was the response given, and the attempt to wrest Canada from the rule of the British was promptly and completely defeated. To mark their appreciation of services rendered during these stirring times by the Indian allies of the British, the Government caused to be issued among the chief warriors a number of silver medals, bearing on the obverse a bust of the King and the words "Georgius III., Dei Gratia." On the reverse appears the Royal arms, without inscription or date. There are two or three varieties of this medal, all of similar design, but varying in size, the largest weighing 4¼ ounces.

Thirty-seven years after the American invasion, the war known as that of 1812-14 broke out, and once more the Canadians were put upon the defensive. This war was attended with at least one good result: it served to shew the loyalty of the Canadians to the British throne, and their deliberate preferment for a British connection. Their loyalty had been impeached and spoken of as a thing which might be easily corrupted by bribery, or daunted by threats; but the invaders found them animated by a very different spirit when the invasion was made. Their bribes were rejected; threats were unheeded, and the invaders repelled. To this defeat the gallantry of the Canadians largely contributed. This war has left us many souvenirs in the form of medals, some of which are now extremely rare, and, therefore, greatly sought after by collectors.

Following the course adopted after the invasion of 1775, the British Government presented to the Indian chiefs medals similar to those issued at that time; but in this instance the date (1814) was added, to distinguish the medals from those previously awarded. The medals are also of superior workmanship, noticeable more particularly in the arms on the reverse. Medals were also distributed in 1848 (!) to the

Canadian regiments which had taken part in the war. This medal is the ordinary English War Medal, bearing on the obverse the head of Victoria, with the date 1848; the reverse shewing Victoria crowning the Duke of Wellington, and the inscription: "To the British Army, 1793-1814." The clasps attached to this medal bear the names, "Chateauguay," "Chrysler's Farm," or "Detroit."

There is also a medal with the same obverse as the Indian medals; but the reverse presents a landscape with a church and buildings in the distance, and a wolf and lion in the foreground. The significance of this medal is a mystery to Canadian collectors; but time will probably reveal its meaning.

Still another medal remains to be described—namely, that of the Royal and Patriotic Society of Upper Canada.

This Society grew out of the peculiar circumstances of Upper Canada when war was declared by the United States against Great Britain in 1812. Utterly unprepared for war, the militia of the province was suddenly called to the frontier to oppose invasion: it had neither arms nor clothing.

The first attention of their gallant leader, after arming them at the expense of the enemy, was to provide clothing suitable to the severity of the then approaching season.

From some cause, not explained, actual relief was so long delayed, that individual sympathy was excited; and the inhabitants of York (now Toronto), by a private subscription, aided by the personal labors of the young ladies of the place, afforded a supply of clothing to the companies doing duty on the lines between Niagara and Fort Erie. It was soon discovered that great distress must unavoidably, in many cases, result to families deprived of their sole support—the labor of fathers, husbands, sons, and brothers, employed in arms. To meet, in some degree, and to alleviate such distress, an association, to be known as the Loyal and Patriotic

Society of Upper Canada, was projected, and instantly adopted, with a zeal creditable to the inhabitants of York.

The objects of this Society were to afford aid and relief to the families of the militia, and to reward merit, excite emulation, and commemorate glorious exploits by bestowing medals or other honorable distinctions for extraordinary instances of heroism.

A sum of money was voted to put into effect the latter part of the Society's plans, and the following description of the desired medal was sent to England :—Medal to be "two inches and one-half in diameter." In a circle, formed by a wreath of laurel, the words, "For merit. Presented by a grateful country." On the obverse, a streight between two lakes; on the north side a Beaver (emblem of peaceful industry), the ancient armorial bearing of Canada. In the back-ground, an English Lion slumbering. On the south side of the streight, the American Eagle planeing in the air as if checked from seizing the Beaver by the presence of the Lion. Legend, "Upper Canada preserved."

It appears from the records of the Society that the artist (whose name is not known) did not adhere to the design and instructions given, and the medals prepared by him were rejected. A committee was appointed to further consider this question ; and at a meeting held June 12, 1813, it was recommended, and adopted, "that £1,000 sterling be placed at the disposal of the treasurer, to procure medals of the same device as that previously ordered." Also, "towards carrying into effect the third object of the society, that 200 silver medals be struck, and that a communication of the resolution be made by the President to His Excellency Lt.-Governor Gore, with a request that he would cause them to be executed."

The dies for this medal were prepared by Mr. Wyon, and the order was completed to the entire satisfaction of the committee.

The rejected medals remained for many years in the possession of the late Alex. Wood, Esq., of Toronto, and were at length defaced by a blacksmith named Paul Bishop, who was employed for the purpose. The gold was sold to a watchmaker of Toronto, named J. G. Joseph; while the silver ones passed into the hands of another jeweller, named T. MacMurray.*

Before I proceed to speak of the medals commemorating the visit of the Prince of Wales to Canada, in 1860, it may not prove uninteresting to take a passing glance at a few medals which, during the intermediate years, were issued by various literary, art, and scientific societies. Foremost, in point of time and interest, is that prepared for the Society before the members of which I have now the honor to read this paper. The Society has done much in the past, and is still labouring for the advancement of literature and science; and few there are who are not acquainted, to some extent, with its objects and aims. While the Society itself is so well known, the medal formerly awarded by it is probably unknown to nine-tenths of the numismatists of Canada; and, thus far, I know of but one collection in which it is to be found. The medal of the Natural History Society of Montreal is worthy a place by the side of that just referred to. In 1851 Canada took its place among the nations of the earth at the World's Exhibition held in London; and, by the display of its mining, agricultural, and manufacturing resources, made a deep and favorable impression upon the mother-country and foreign nations. In addition to the medal awarded by the Royal Commissioners, the Earl of Elgin generously added thereto one which bears on the obverse the Earl's arms, and the inscription, "Canadian Prize—Great Exhibition, 1851;" while the reverse bears the name of the noble donor, and

* For this information I am indebted to an article in the *Canadian Antiquarian*, furnished by a clergyman at Metis.

within a wreath is placed the name of the recipient. The following year, the Board of Agriculture for the Province was established; and the prize-medal adopted by it proved a valued addition to those already possessed by Canada. The design chosen, consisting of the arms and name of the Board on the obverse, and the reverse with its representation of Fame and the simple inscription, "Exposition Provinciale Agricole," plainly marks out the object for which the medal is issued and the Society awarding it.

The brethren of the "Mystic Tie" have also contributed their quota to the numismatic treasures of our Dominion. The event perpetuated by this medal is the union of the Grand Lodges, which was consummated 14th July, 1858.

It is now my pleasing duty to speak of an event which, above all others, of later days, spread unusual pleasure and satisfaction over our land. I refer to the visit of His Royal Highness Albert Edward, Prince of Wales. For many years there had been a growing desire on the part of her Majesty's subjects in Canada to have an opportunity of seeing their Sovereign, or, at least, some representative who should be so in more than an official sense. When the address of the Houses of Parliament was presented, the promise made by her Majesty (after a complete acceptance) was the most agreeable answer that could have been returned; and on the 24th July, 1860, her beloved son landed in the North-American colonies. This visit was remarkable for a variety of reasons, and every locality visited by the Prince has its own peculiar mementoes: the most lasting, however, will be the medals which were struck in honor of the same, or which were subsequently founded by the Prince as marks of his appreciation of the hearty reception accorded him. Of the former class of medal we have seven types. There is, first, the Hoffnung medal, with its two varieties. This was prepared for the dealer by whose name it is now known. It is a very fine medal, and, with its view of the

Victoria bridge and full particulars relating thereto, will always prove of value. The difference in the varieties is caused by an error as to the cost of the bridge, $5,000,000 appearing on one and $7,000,000 on the other.

Another (very poorly executed) medal was largely disposed of during the visit. It has a bust of the Prince on the obverse, and the inscription, "To commemorate the visit of Albert Edward, Prince of Wales, to Canada, 1860." There are three varieties of this type. On one the Prince has a moustache; the other being minus that mark of manliness. In both these the inscriptions are in square letters. The third variety has the moustache also, but the letters are Roman. Still another variety of this medal is found with the obverse of the first-described, while the reverse bears a very creditable representation of Victoria Bridge, with the inscription, "Victoria Bridge, Montreal, opened by the Prince of Wales, 1860." The immediate object of the Prince's visit was to open the bridge referred to on these medals; and it is, therefore, but natural that while private enterprise sought to commemorate the event by medals, the Directors of the Grand Trunk should likewise adopt a similar course. Their decision to do so has given us the most beautiful medal of the series, reflecting credit on their taste, and particularly so upon the artists who produced it (Messrs. J. S. & A. B. Wyon, of 287 Regent-street, London). The obverse bears a head of the Royal visitor, with his title surrounding it; while the reverse has the badge of the Prince surrounded by a wreath, and the word "Welcome" thrice repeated. Surrounding the whole appear the words: "Visited Canada and inaugurated the Victoria Bridge, 1860."

During his stay in Montreal the Prince formally opened the Industrial Exhibition, held in the building erected for that purpose by the Board of Arts and Manufactures. A prize-medal was prepared by the Messrs. Wyon for the Board, and was extensively distributed among the exhibitors. It bears

the arms of the Board on the obverse, and on the reverse a wreath of maple leaves enclosing the inscription: "Exhibition of Canadian Industry. Opening of Victoria Bridge by H. R. H. Prince of Wales. Montreal, 1860."

As I have already stated, the Prince, to mark his appreciation of the kind reception given him in Canada, placed a sum of money at the disposal of several of the colleges and educational institutes to found prizes, as might be thought most advisable. It is not necessary that I should describe the medals, which are now lasting mementoes of the Prince's visit. The colleges which adopted medals are the McGill College, Montreal; Bishop's College, Lennoxville; Victoria College, Cobourg; and the Council of Public Instruction for the Province of Quebec. With the exception of Victoria College medal, the bust of the Prince is placed on the obverse; while the reverse bears an inscription commemorating the Prince's visit, in some instances supplemented by the arms of the college. The Victoria medal has her Majesty's bust instead of the Prince's.

In 1864 the tercentenary of the birth of Shakspere was celebrated, and the citizens of Montreal founded a medal to be awarded to students in McGill College for proficiency in English literature. On the obverse is placed the bust and name of Shakspere, with the dates of birth and death, 1564-1616. The reverse is richly ornamented, and bears the name of the college, the course for which the medal is awarded, and the event which it commemorates.

It would afford me great pleasure to have closed my paper with descriptions of medals struck as mementoes of the triumph of the arts and sciences or the spread of knowledge; but, unfortunately, such cannot be.

The circumstances which led to the issue of the medal next to be described are of such a nature as to render it difficult to express in words the indignation which must be felt by every

Canadian when he recalls the scenes of 1866. It is hard to realize that from a land with which we were at peace there should be permitted to march such hordes of lawless ruffians as during that year invaded our country. Without noticing the circumstances which gave rise to the political organization known as the "Fenian Brotherhood," or to the encouragement given them by the citizens of the United States, I shall simply state that, unheeded, or, at least, unrestrained, they were permitted to arm, drill, and march, as an invading force, across our borders, and for a (very) brief season spread confusion among the peaceful farmers on the borders, and, unhappily, shed the blood of a few of our noble young men who had gone forth to repel them. With unprincipled leaders and demoralized men, it was but natural that the miserable attempt to free Ireland by sacking Canada should fail, and that they found the whole country a unit in its defence. The principal scene of action in this, the "first invasion," was in the western part of our land; and the most disastrous to the lives of our volunteers was the engagement at Ridgeway. The brave men who took part that day in their country's defence will always receive honor for their services. But while the government, the press, and the people freely attested to their heroism, there were some who looked to still further honors. The County of Welland was the only locality in which this plan was adopted, and dies were ordered for a medal, which were, however, but little used, owing to unwillingness, on the part of the government, to allow the wearing of such decorations unless emanating from the authorities usually charged with such duties. They very naturally feared that the indiscriminate bestowal of medals would lessen the value now attached by British soldiers to such honors. Certainly, the medal prepared can scarcely be considered a "thing of beauty." It is exceedingly plain, and but poorly executed; nevertheless, from the fact that (so far as I can learn) but two specimens were struck, it will always be scarce. On the obverse is a cannon and the inscription,

"Fort Erie, June 2nd, 1866." The reverse has in a circle: "Presented by the County of Welland."

With pleasure I leave this subject, and proceed to speak of an event which, above all others, deserved to be handed down to future ages by the medallic art. The confederation of the whole North-American colonies had for years been suggested, and debates in the Houses of Parliament had taken place upon the subject. The time was now approaching when the great desire of the people was about to be consummated. The legislatures of New Brunswick, Nova Scotia, and Newfoundland passed resolutions adopting the scheme. The latter, however, failed to carry them into practical effect; while Prince Edward Island wholly declined to become part of the Dominion. All the preliminaries having been disposed of, the final terms were submitted to the Imperial Parliament; and on the 22nd May, 1867, the work of legislation being fully completed, her Majesty was pleased to issue her Royal proclamation, appointing the first day of July as the day on which the DOMINION OF CANADA should commence its existence. The great project of confedération was completed, and "the morning-voice of a new people was heard among the nations of the earth."

To commemorate this important work, the Messrs. Wyon, of London, were instructed by the Canadian Government to prepare a medal; and the genius and skill of those artists have produced a work which will bear comparison with any medal ever published. It is massive, measuring four inches in diameter. On the obverse is a bust of her Majesty crowned, and with a veil which covers the back of the head and neck. The inscription, "Victoria, D. G., Britt. Reg., J. D.," surrounds the bust. On the reverse is an allegorical design, representing Britannia conferring the charter of Confederation upon the four provinces, Ontario, Quebec, Nova Scotia, and New Brunswick. "Juventas et Patrius vigor Canada Instaurata, 1867," is the motto which surrounds the group.

Since the inauguration of the New Dominion, British Columbia and the North-West Territory, with their vast extent of rich soil and mines, have been added; and the Government, to mark their appreciation of services rendered by the Indians in the North-West, have issued a medal which bears a head of Victoria, with the title "Victoria Regina" on the obverse; while the reverse simply bears a wreath of oak leaves. A *combination*-medal (if I may use such a term) was also prepared for distribution among the chiefs. This was made by adding to the Confederation-medal a rim of about half an inch in width, on which were placed raised letters as follows: "Dominion of Canada—Indians of the North-West—Chiefs' medal." From this manufactured copy, electrotype-shells were taken, filled with lead, and the whole silver-plated. I know not whether these were distributed to the "poor Indians" as silver medals; but if so, it was anything but creditable to those who ordered them; and I can imagine the disgust of some dusky warrior who shall attempt to renew his stock of fire-water by offering in payment his lump of silvered copper and lead.

Two or three medals have been issued since the date just referred to; but, with the exception of one prepared to mark the celebration of the thanksgiving-services for the recovery of the Prince of Wales, they can scarcely be classed among those which come within the compass of a paper such as the present. The Thanksgiving-medal will always be prized as a beautiful medal, worthy of a place by the side of the many which Canada may now boast of possessing.

NOTE.—I would add that for historical *data* I am indebted to the following sources:

History of Cape Breton, by Brown.
Conquest of Canada, by Kirke.
National Medals, by Mudie.
History of Canada, by Dr. Miles, McMullen, Smith, and Bell.
War of 1812-14, by Auchinlick.

Medals, &c., Exhibited.

1—DeLévis.
2—Kebeka Liberata.
[These two medals are in the Museum of the Literary and Historical Society of Quebec.]
3—Founding of Louisbourg.
4 and 5—Louisbourg Taken.
6—Boscawen Medallet (very rare).
7—Wolfe.
8—Saunders and Wolfe: Quebec Taken.
9—Conquest of Canada Completed, and Montreal Taken.
11—Lithograph of rare Montreal Medal.
12 and 13—General Commemoration.
15—Indian Medal, 1814.
16— do do Landscape.
17—Upper Canada Preserved.
18—Elgin.
19—Agricultural Society's.
20—Masonic.
21—Hoffnung.
22—Prince of Wales—To Commemorate, &c.
23— do Victoria Bridge.
24— do Grand Trunk Company.
25— do Board of Arts.
26— do McGill College.
27— do Bishop's College.
28— do Victoria College.
29—Shakspere.
30—Confederation.
31—Indian.
32—Prince of Wales' Thanksgiving.

PAPER IV.—"SOME OBSERVATIONS ON CANADIAN CHOROGRAPHY AND TOPOGRAPHY, AND ON THE MERITORIOUS SERVICES OF THE LATE JEAN BAPTISTE DUBERGER, SENR."

BY H. H. MILES, LL.D.

(*Read before the Society, January 29th, 1873.*)

THE art and practice of making maps or charts of the features of particular regions and Provinces, so as to delineate to the eye their positions, boundaries, subdivisions, and occupation by proprietors—that is, *Chorography*—has attained to no small degree of excellence in Canada. A similar remark might be made concerning *Topography*, differing from the former as the delineation of a town or small district does from that of a whole country.

For a long time after the cession to Great Britain, in 1763, native genius for pursuits of any kind not immediately connected with the necessary requirements of daily life, had little or no opportunity of cultivation, or even of making its existence manifest. As respected professional occupations, in connection with religion, law, medicine, and the ordinary preliminary acquirements derivable from courses of education, whatever opportunities did exist in the country itself were to be found only at the city of Quebec. Art was an exotic; and if any persons wished to cultivate the arts, such as music and painting, or any refined pursuit requiring special training and skill, it was necessary, if the expense could be afforded, to go abroad to the metropolitan centres in England and France to seek the necessary facilities. Down to a comparatively recent period, whatever was needed to minister to art of any kind was wofully deficient in Canada; so that the Catholic Bishop Plessis, who died in 1825, and who had a great taste for painting, is recorded to have long and earnestly sought the means of replacing by better, yet

cheap, foreign productions, the pictures in use for embellishing his country churches, though they were believed to be fine by the people at large, and especially reverenced when they happened to be the work of native artists. In fact, the Bishop found them repugnant to all his ideas of art, and sometimes grotesque enough to excite his well-known risible faculties, in spite of efforts to preserve his gravity.

I do not mean to say that there were absolutely no persons acquainted with the polite arts among the seigneurs and clergy. But these were few and scattered; and whatever their disposition may have been to generate a good taste among the people, the circumstances in which they were placed were such as to prevent the exercise of any considerable amount of useful influence in that direction. Of course, what has been stated concerning art generally is applicable to the pursuits now under notice; and if any native French-Canadians have excelled in these, as some are known to have done towards the end of last century,—for instance, *Charland* and several others whose names might be cited, and especially *Jean Baptiste Duberger*,—then, all the greater may their merit be esteemed, and so much the more worthy are they of our remembrance and of honourable places in the list of Canadian worthies.

Being, as I shall endeavour briefly to recall to the notice of the members of this Society, connected historically with the progress of a country, the pursuits of those men seem to be included in the Society's objects.

I shall premise a few more remarks concerning maps and charts generally; and when I have done this, I shall refer more particularly to the career of those that are Canadian, and which illustrate the chorography of this country since the cession.

So far as my experience enables me to judge, most people, when they think or talk about maps, seem to do so as if they

considered them matters of no great importance, except for reference for ordinary geographical purposes, or to accompany the perusal of books. The fact is often overlooked that numerous branches of art and manufacture minister to the production of well-executed maps; that the particulars to be inserted are themselves results which could not have been procured unless numerous other pursuits flourished, requiring labour, science, and skill for their exercise; that the equipments and qualifications of an accomplished surveyor, even to furnish some of the topographical particulars, imply the existence of many branches of knowledge, and long-laboured-for refinements of art and skill in the mere construction of his instruments; that maps, even when faulty as to execution and incorrect as to contents, have often a very high value as historical records and as shewing the state of art and geographical knowledge at the time when they were made, and as measures, by comparison with older and subsequent maps, of human progress. If we could only obtain a correct history of maps and charts themselves, say of Canada, with an assorted series of specimens of them lodged in some accessible quarter, we should have the means of familiarizing ourselves with the history of its progress, political, religious, social, and intellectual, far more generally useful and far more easy of comprehension than could be offered by any number of merely descriptive historical works, however eloquently written. We should be reminded, by the concessions of estates granted or sold, of the meritorious persons by whom the progress has been chiefly promoted. We should realize, at a glance, when and by whom settlements were commenced; villages, towns, and cities were founded; when and where roads and bridges, and canals, railroads, and telegraphs, were established, to supply the wants of increasing population and commerce. Nothing, in an historical point of view, and as regards progress, could be more valuable, as a record, than such a series of maps and charts. Those, then, who have

laboured successfully in the production of such records,—who have devoted their time and their skill to such objects, whether as the original producers of the maps and charts, or as correct and skilful copyists,—certainly merit our respect, and deserve to be remembered whenever we seek to recall the memory of those who may have deserved well of their countrymen.

We do not at this time possess in Canada any arranged collection of maps and charts illustrative of the history and progress of the country, accessible to the public. The best and most extensive is undoubtedly that deposited in the Crown Lands Department of this Province, where there are many originals, and copies of these kept in order for reference and for official uses; and this collection is, of course, being continually increased by the work of a considerable body of highly-qualified gentlemen connected with that department. But I here speak of maps available for reference by the public, and not merely for departmental service, which is quite a different thing. There are the *elements* of such a collection, but dispersed; and they can scarcely be said to be *catalogued* or generally accessible. In the library of the Laval University are to be found numerous maps and plans relative to events, regions explored, and structures, under the old French *régime*. In the splendid library of the Dominion, at Ottawa, is the largest collection, with respect to historical purposes, including many of the oldest maps of British North America, from the southern boundary of Nova Scotia and the St. Lawrence to the Arctic circle. An inspection of the catalogue of the Parliamentary Library would shew how many valuable illustrations of the history and progress of this country, in the shape of maps and charts, might there be found. All who have the pleasure of knowing the enlightened and accurate librarian, Mr. Todd, are aware of his ability to appreciate the utility of such records. But who can wonder that, in the absence of space and

opportunities of having them arranged and exhibited, so as to be conveniently accessible to the public, and amidst overwhelming labours entailed by other prescribed duties, there should be wanting, even in the catalogue, the appearance of chronological order? Besides, the collection there deposited is very incomplete, indeed, as respects North-American and Canadian chorography and topography. There are, I believe, no maps or charts in the recently-commenced libraries of the Local Governments; and it is not within my knowledge, though I have often made enquiries concerning this matter, that any private individuals have devoted themselves to the making of such collections. When we consider the relations of chorography and topography to history; the neglect which prevailed during the whole of the last century to regard maps, especially old ones, as essential historical records, and, therefore, to preserve or recover them; the various causes of loss of old maps; the nature of the materials—wax, brass, copper, silver, paper—to which the precious lines of maps have been committed, and the carelessness and rapacity of conquerors, whenever these documents have fallen into their hands; the necessary wearing-out of those inserted in books for their illustration; the jealousy of ancient and modern maritime nations, which induced them to conceal from their rivals in commerce all knowledge of their treasures of this class; the general disposition to discard, as no longer useful, old maps of regions incorrectly or imperfectly delineated, and to supersede them by others of more recent origin; and that the work of exploring, surveying and map-making, is susceptible of an endless approximation to truth and perfection,—we can be at no loss to account for the absence of a complete collection, not only in Canada, but in any other country. The considerations associated with these points are certainly worthy of serious attention; and if time permitted, it would be easy to shew that they are now generally held to be so in England, France, Germany, and the United States.

Geographers, travellers, and historians have commonly inscribed in their maps many things not spoken of in their writings, finding it a less laborious and a quicker method of reaching the understanding to speak to the eye than to the ear. Their maps often serve us in place of books. Older maps are required for testing and verifying the information conveyed by new ones. Boundary questions, so prolific a source of warfare and misery in the American history, and various political and social considerations, have been, as everybody knows, intimately and vitally connected with, and dependent upon, the matters of which we now speak. Need we, in this connection, refer to the early quarrels between the Spaniards and Portuguese with respect to the division between them of the tropical regions of North and South America?—to the innumerable collisions between the French and English as to their limits further north?—to the disputes between England, France, and Spain, concerning Florida, Nova Scotia, and the regions beyond the Alleghany mountains?—to the uncertain state in which boundary questions were left concerning Canada and the United States, or, rather, inherited by these from the forefathers of the people of both? It has been alleged that during the 17th and 18th centuries no war occurred in Europe which was not in some degree connected with such questions, respecting boundaries in the western hemisphere, and no treaty of peace concluded without some articles or stipulations concerning them. On such occasions American maps were in general request; and it is said that when the treaty of Aix-la-Chapelle was negotiated by French and English commissioners, the single question of the limits of Nova Scotia occasioned the recourse to at least fifty American maps, old and new. Maps have played an equally conspicuous part in later important transactions of an international character. Witness the settlement of the N.E. boundary dispute, when Lord Ashburton and the British negociators are alleged to have acceded to an agreement by which we

Canadians and our posterity now and forever are held bound to a result which debars us from the use of a much better approach to the ocean than our own territory can afford, but which need not have been accepted if existing authentic maps had then been accessible or known to both parties. Witness, also, the more recent and menacing controversies respecting boundaries in the north and west, down to the conclusion of the late Washington Treaty, by which, happily, though, perhaps, at some unnecessary sacrifice of interests appertaining to both sides, all such traditional and irritating sources of trouble appear to be at length removed.

Much more might be advanced than has been alluded to in this imperfect sketch, to shew the great value and importance of map-making, both in international and social points of view, and to shew that those who have devoted themselves to their execution, or to the subsidiary arts and sciences, are worthy of high estimation amongst us.

In the earlier days of Canada, after the Province had come under British rule, and thence down to the present day, the governing authorities seem never to have lost sight of the importance of causing the chorography and topography to be accurately delineated. General Murray, the first resident British governor, commissioned Captain (afterwards Colonel) Montresor, of the Royal Engineers, to survey and map the River St. Lawrence, from Montreal down to the Island of St. Barnaby, opposite Rimouski. His map, which is extant, was, I believe, the very first executed after the capture of Montreal in 1760. For a long time, while the military and civil governments were necessarily associated, the exploration of the course of the St. Lawrence, extending upwards, to, and beyond Lake Ontario, and that of the regions north and south of the river, was continued under Sir Samuel Holland and succeeding surveyors-general. Lord Dorchester, Haldimand, Prescott, Milnes, and their successors in the administration of the Province, down to recent times, when

all that kind of work has been given in charge of one of the Civil Departments, appear to have attached the greatest consequence to the perfecting of those surveys and to the multiplication of correct maps. Not only military considerations, but also those relating to settlement and revenue, stimulated the authorities to continue the work under the conduct of officers and men the best qualified by professional experience to carry it on. Hence we have—deposited, however, in different quarters—numerous maps and charts of Canada, shewing what the country was and how it grew in settlement and population, and what its territorial, electoral, and other divisions have been from time to time, down to the present day. Some exhibit the oldest concessions made during the time when Canada was a French Province, and are extremely interesting in an historical point of view,—concessions along the banks of the St. Lawrence, the lower Ottawa, the Richelieu, Yamaska, and St. Francis. Succeeding officials, the Bouchettes, Captains Bayfield and Orlebar, and others, as well as many officers of the Royal Engineers, contributed from time to time; and we now have in this country the details of its chorography and topography as completely and accurately laid out as suffice for the requirements of the present generation, and as place it, with respect to the settled portions, almost on a par with the most densely-inhabited regions of Europe: and I may add that under the auspices of the Federal and Local Governments, the same kind of useful work continues to be actively prosecuted.

But it is time to advert more particularly to the very talented and meritorious person whose name is associated with the objects of this paper.

Jean Baptiste Dubergrr (or, as he usually signed himself, *John Baptist* Duberger) was born at Detroit on Feby. 17th, 1767. When quite young he was sent by his friends to Quebec, furnished with money enough, in the form of pieces

of silver, to pay his expenses down, and to secure his admission as a resident-scholar in the Seminary of Quebec. If, as is supposed, he was then about 15 years of age, he must have spent, subsequently, about seven years in that institution; for, in his 23rd year, having given evidence of mechanical genius and of aptitude in the art of drawing, he was taken into the service of the R. E. Department, on the staff of which he continued to be employed during the remainder of his life.

In official documents we find Duberger styled "Mr. Duberger, of the first class of Royal Military Surveyors, and Draftsman."

Although, as will be shewn, Duberger did much towards supplementing and illustrating Canadian history, his name is not even placed on record in the, perhaps, too extensive list of Canadian worthies compiled by Mr. H. J. Morgan, of Ottawa; nor do we find it in that writer's *Bibliotheca Canadensis.* But Bibaud, in his *Panthéon Canadien,* has furnished a brief and imperfect sketch of Duberger. What we know of his career is derived principally from his surviving relatives and from his works themselves, and partly from incidental notices of which he became the subject in consequence of his connection with the famous Colonel By, who superintended the erection of the Martello Towers, still permitted to remain standing on the Plains of Abraham, and who subsequently constructed the works of the Rideau Canal between Ottawa and Kingston.

Duberger's peculiar aptitude for the construction and embellishment of charts of the country was in constant requisition after his entrance into the R. E. staff, in 1789, until the close of the American war—that is, about a quarter of a century,—when, he being afflicted with partial paralysis and frequent ill-health generally, most of his customary work was assigned to his son, of the same name, who inherited much of his father's talent and ability.

At the time when Duberger became connected with the R. E. Department at Quebec, something, as has been stated, had been accomplished in the way of surveying the country and establishing its chorography, but not much in that of exhibiting the results of surveys with precision and elegance. The military authorities being then the sole depositories of whatever had been done, or was required to be done, of that nature, Duberger, after passing through a species of apprenticeship in the Department, which served to make known his extraordinary aptitude both for surveying and for executing maps, was appointed a chief draftsman and surveyor, about the year 1790. More to his natural gifts, his powers of observation, and his manual skill, must be ascribed his having attained to fitness for the post than to the opportunities accessible during his youth to the natives of Canada, or even to the facilities afforded by the R. E. Department. Until towards the close of the century, he appears to have been chiefly employed in *copying* and in multiplying copies of the older maps to which allusion has already been made. Undoubtedly, Duberger executed beautiful copies of most of them, although those now remaining in this country have usually not his name attached, having been copied by *Charland*, *Gale*, and others. Before the British troops were withdrawn from this country, I saw among the copies of maps in the R. E. office a set of them evidently executed by him, and having his signature; and these, being the best, were naturally selected for removal. In the practice pursued, it sometimes happened that Duberger delineated the map itself, while the whole or part of the lettering and references was left for other and less skilful hands.

I do not feel competent, by means of any critical description which I can furnish, to present an adequate estimate of his skill in drawing maps. Those who, in the course of their profession, are familiar with such matters and with his style, invariably speak of his artistical merit

in terms of the highest commendation, and as having been far superior to that of any other draftsman of his day. Mr. Lambert, in the narrative of his visit to Quebec, in the autumn of 1806, makes the following mention of him:

(EXTRACT from *Lambert's Travels*, vol. 1, page 330.)

"Before I quit the subject of the arts in Canada, a country seemingly more capable of supporting than creating genius, I must not omit to mention, with the approbation he deservedly merits, a gentleman of the name of Duberger, a native of that country, and an officer in the corps of Engineers, and Military Draughtsman. He is a self-taught genius, and has had no other advantage than what the Province afforded him, for he has never been out of the country. He excels in the mechanical arts and the drawing of military surveys, &c. He had the politeness to shew me several of his large draughts of the country, and many other drawings, some of which were beautifully done, and are deposited in the Engineers' office. The only correct chart of Lower Canada, and which was published in London by Faden, in the name of Mr. Vondenvelden, was taken by Mr. Duberger and another gentleman, whose names had a much greater right to appear on the chart than the one which is at present there."

Several years after the time of Lambert's visit, Duberger began gradually to retire from the active work of copying and surveying, in consequence of bad health, being succeeded by his son, of the same name, who, as has been mentioned, inherited much of his father's ability. In fact, work executed by Duberger junior has frequently been taken to have been that of the father. Of his qualifications as a surveyor, which were undoubtedly great, entitling him to the post he held as such in the distinguished R. E. service, we cannot, probably, cite corresponding printed or official evidence. The truth is, the services of the civil *employés* of the department were merged in or obscured by those of the military engineers, who always took precedence of the others. Whenever work was done conjointly by the military and civil *employés*, it was always officially held to be executed by the former, or under their direction. For this reason, perhaps, Duberger sometimes did not receive nearly so much credit for his work as he was entitled to. So far as

we know, one of his first pieces of workmanship in the R. E. office was the taking of copies of the old military plan of the siege-operations at Quebec, in 1759; his last work, in 1814 or 1815, was to take part in the survey of the district of Chateauguay, the scene of DeSalaberry's exploit, of which there are also several beautifully-executed drafts, with his signature attached. There are still living amongst us aged and reliable persons who knew Duberger personally, who remember his appearance in the uniform and with the sword he was entitled to wear, and who recall, when they make mention of him, the pride he took in the exercise of his profession.

Through the kindness of the officials of the Crown Lands Department, I am enabled to place here, for the inspection of any who please, some few specimens of his skill in map-drawing.

I now pass on to the mention of the principal work with which his name and memory have been associated. I quote again from Lambert's book:

"But the most important of his labours is a beautiful model of Quebec, upon which he is at present employed, in conjunction with a school-fellow of mine, Capt. By, of the Engineers, whom I had the unexpected pleasure of meeting in Canada after an absence of ten years. The whole of the model is sketched out, and a great part is finished, particularly the fortifications and public buildings. It is upwards of 35 feet in length, and comprises a considerable portion of the Plains of Abraham, as far as the spot where Wolfe died. That which is done is finished with exquisite neatness, cut entirely out of wood, and modelled to a certain scale; so that every part will be completed with singular correctness, even to the very shape and projection of the rock, the elevations and descents in the city and on the Plains, particularly those eminences which command the garrison. It is to be sent to England when finished, and will, no doubt, be received by the British Government with the approbation it merits. *

* "It is now (1813) deposited at Woolwich."

Although, in this account, a part of the credit of this vast undertaking is ascribed to Captain (afterwards Colonel) By,

we may feel assured that Duberger's hands executed it. Lambert says, "the whole of the model is *sketched* out"—that is, in 1806 or 1807. I have found no other allusion to the sketch, or *cartoon*, as, perhaps, we might name it, being, we may presume, the index or guide prepared before pieces of wood to form the model could be cut out. By, who was soon after to serve as an engineer-officer in the construction of the Martello Towers, and thus to carry into effect, after the lapse of half a century, the plans for defending Quebec discussed and proposed by General Murray and Patrick Makellar in 1759 and 1760, did, in all probability, conduct or assist in the preliminary survey of the ground. What Duberger may have done in this respect—if, indeed, he did anything—would be attributed officially to By, for the reason already stated. But we have no grounds whatever for believing that the latter either drew the sketch to work from or put his hand to the formation of the pieces of the model. To assist in establishing this point, I referred to an aged associate of Duberger, who served in another capacity in the same department. He informs me that he has a perfect recollection of Duberger and of the construction of the model; that Duberger did all the work himself; that he cut out all the pieces and put them together, from time to time, in detached lots, as he progressed, *in his own residence*, a small cottage on the Esplanade, which is still to be seen there, though, perhaps, somewhat enlarged and altered in external appearance.

The credit of having constructed this model has been the subject of a controversy, into which I do not propose to enter at length, but only to allude briefly to some principal particulars. By carried the model to England in the year 1811—ostensibly, it is alleged, to bring it under the notice of the British Government in Duberger's behalf, and to solicit for him such reward as might be accorded. It is further alleged that a pecuniary reward was granted.

According to the testimony of Mr. Duberger's surviving children, on news of the fate of the model reached Canada for several years; but, about 1817 or 1818, one of his sons, since deceased, called on the Colonel in London, when some explanation took place between them. Colonel By offered to interest himself in the young man's behalf, so as to procure employment for him, which the latter indignantly rejected, asserting that the Colonel ought first to repair a wrong done to Duberger and his family with respect to the model.

The evidence against By, of whom there is now no descendant left either to refute such a charge or to make tardy reparation, is certainly not complete; but these facts, having some bearing on the case, can be substantiated, namely, that the model was taken to England in 1811, and submitted to the inspection of the Duke of Wellington and other military authorities; that it was approved of by them, and presently placed on exhibition at Woolwich; that for a long time, down to the year 1831, it went by the name of "By's Model of Quebec," although occasionally, when Canadians visited Woolwich, remonstrances were uttered, to the effect that it was incorrect and unjust thus to ascribe the credit of it to Colonel By; that then a fresh inscription was attached to it, intimating that the whole credit was not due to that officer. The following facts ought, perhaps, also to be taken into account:—Colonel By was an officer of great zeal and ability. He came to Canada in 1800; soon after which he was entrusted with the construction of a boat-canal at the Cascades, above Montreal. This being accomplished, he was subsequently charged, as an officer of the Royal Engineers, with the supervisiou, in whole or in part, of the erection of the Martello Towers on the west side of Quebec. Many years afterwards we find him again in Canada, originating and completing a great public work, the Rideau Canal. In 1832 he left Canada for England, in order to

vindicate his character from charges made against him in consequence of mismanagement in the pecuniary affairs of that undertaking; and he died soon after. It is also reported, in his biography, that his death was accelerated through having experienced neglect and reproaches in quarters to which he looked for a favourable reception and support against his accusers.

I shall only remark, here, that this account of By, though not wholly incompatible with the idea of his having dealt wrongfully by Duberger, to the extent of assuming the whole credit of the model, and of not accounting to him for what might be due to him for its construction, still does not furnish proof against the Colonel. On the other hand, it is plain that he had a direct concern, in connection with his work on the Martello Towers, in illustrating the environs and fortifications of Quebec, that the British authorities should perfectly comprehend all local particulars—an object which the great model was likely to promote. Being a man whose mind was ever busy with large schemes, and an engineer, it does not seem incredible that he originated the idea of the model, there being at hand a great artist and genius like Duberger to execute all the details of the work. The whole subject of the controversy, however, though historically interesting, is a painful one to our feelings; and the more so, when we take into account Duberger's personal worth, his ill-health, his diffidence, and his childlike disposition to entrust the care of his reputation and his other interests to another.

As stated by Lambert, the model, when finished, was more than 35 feet long. In width it was sufficient to embrace the site of the fortifications, of part of the Lower-Town, and the precipitous declivities which formed the northern and southern boundaries of the Plains of Abraham.

Within a few months past I have obtained some particulars concerning the present condition of the model, now upwards

of 60 years old—particulars kindly furnished, at my request, by a Montreal friend and a resident of Woolwich.

According to this information, about twelve years since, the model was reduced to about one-half of its former dimensions, in order to make space for the reception of more modern objects connected with warfare. A new inscription was affixed to it on a brass plate, in the following words:

"Model of Quebec—made by Mr. DeBerger, of the R. E. "Department, Quebec, under the direction of Major By, about "1830 (1813?). Scale, about $\frac{1}{300}$ or 8 yards to an inch. This "model originally included a line of Martello towers crossing "the Plains of Abraham, and extended to the spot at which "Wolfe fell, Sept. 13th, 1759, about 850 yards from the place. "It was reduced in 1860."

It will be seen that this inscription is not quite accurate as to certain facts, although the inaccuracies are not such as are likely to attract much attention on the part of the English public visiting the Rotunda at Woolwich from motives of curiosity and to inspect the collection of various models and objects placed there on exhibition.

I may here mention that, whether By or Duberger first suggested the idea of this particular model, it probably derived its origin from another quarter. I hold in my hand a letter from a Montreal merchant, named Morrison, dated 22nd January, 1826, and addressed to a gentleman and his wife resident at Quebec:

(EXTRACT from a Letter of Mr. Morrison, dated 22nd January, 1826.)

"Having seen in the old *Quebec Gazette* a paragraph by and from a Mr. J. Lambert, who was here some years past; whom I have seen the person, I will herein send you a copy. * * * * * * * 'MODÈLES DE PARIS ET DE QUÉBEC.—En 1798, est-il dit, dans le choix de curiosités on montrait à Paris un modèle très curieux de cette ville, qu'un artiste ingénieux avait été neuf ans à exécuter. Il ne s'était pas contenté de comparer et de corriger tout les plans de Paris publiés jusqu'à lors, il avait encore mesuré

toutes les rues, les places, &c., en suivant ce procédé, le genre de mesurage géométrique le plus extract, et indiqué les inégalités du site de cette immense capitale, au moyen du modellement. Le plus grand diamètre du modèle, dans son étendue de l'est à l'ouest, était de quinze pieds; la hauteur des maisons était de trois lignes.' "

Then follows a description of Duberger's Quebec model, of which the translation has been given above.

In addition to what I have already stated concerning the present condition of the famous Quebec model, I have now to communicate to the Society another fact, which appears to me to be of material consequence. From the same source I learned the probability of having the model not merely reduced in size, but set aside altogether. On this point I will quote the words of my informant, who is entirely reliable, and has the best opportunities of knowing the facts of the case :

(EXTRACT from a Letter dated 22nd October, 1872.)

"I was told that the model, which is, no doubt, a very elaborate work, and admirably done, is found to be very much in the way; the Rotunda being much cramped for room for the exhibition of models of various kinds, of a more modern and practically useful invention, more especially projectiles, and other military inventions. The catalogue is out of print, and a more elaborate one is being printed."

In short, there is now a demand for the space it occupies ; and considering the indifference of the English public concerning such old Canadian works of art, I think we are warranted in assuming that ere long this beautiful trophy of Canadian genius and skill will be removed from its present position, and stowed away, perhaps, as useless lumber; that parts of it will be lost, and finally the whole.

It has occurred to me that the members of the Literary and Historical Society in particular, and the citizens of Quebec in general, may consider it worth while to take some steps with a view to the recovery of this great work, and of lodging it again in what may be styled its native place. I will not presume to offer any suggestions as to the mode of procedure

likely to be effectual in accomplishing this restitution, though I will venture to offer the following remark :—Year by year the visible memorials of old Quebec, which remind us of the conspicuous position which this city, its inhabitants, fortifications, and environs, have occupied in times past, and in connection with many of the important events by which the destinies of the people of North America have been influenced, are passing away; but the restoration of this model would serve, for generations to come, to exemplify native Canadian genius, to preserve a useful link in the connection between the past, the present, and the future of the famous city, and also as a lasting attraction to the visitors who flock to it annually in quest of objects of historical interest.

Before I conclude, I should wish to ask your attention to one or two particulars which have lately been communicated to me by some of Mr. Duberger's surviving children, now, of course, well advanced in years, which they have given me permission to use as I may see fit.

But, first, I may mention that Duberger was twice married; that for several years before his death he was a retired pensioner of the R. E. corps; and that he died at St. Thomas in 1821. The notice of his decease is to be found in the *Quebec Gazette* of Thursday, Sept. 27th, of that year, and is as follows :

"Died, at St. Thomas, on Wednesday, the 19th instant, JOHN BAPTIST "DUBERGER, Esq., upwards of 25 years principal Draftsman and Surveyor "to the R. E. Department, and late on the half pay of officers of the "first-class of that corps."

I will next read extracts from one or two other documents :

(EXTRACTS from a Communication written by Mr. George Duberger, the oldest surviving son of the late J. B. Duberger, and dated Murray Bay, September 3, 1872.)

" * * * * * * * * * * * I send you a letter from a Mr. Wm. Morrison (a particular friend of our family), dated 26th January, 1826, to

my late brother-in-law, Dr. William Fraser (formerly Seigneur of Mount Murray Bay), and to his wife, my sister. The letter, though written in French, may, I believe, convey to you some correct information of the said model of Quebec, as well as other works of my late father, who, as you appear to have been correctly informed, has, in the end, been wronged of his dues, and, at last, died very poor.

"I note here what my old sister has stated. My father was born at Detroit, in Upper Canada, parish of l'Assomption, in the year 1757, on the 7th February, and died at St. Thomas (south shore), in September (21st, I believe), 1821, having been over 30 years in the Government's military service.

"Of his children by my mother (his first wife), we are now only three alive—myself, over 69 years of age, and two sisters, by some years older than myself.

"To return to the children by his second wife. Three sons only remain (or, I should say, remained). *Cyprien*, the eldest, has gone abroad, travelling now over 32 years past, and we have not heard from him since. The next one, *Narcisse*, has for several years been Deputy-Sheriff at Three Rivers: where he is now, or what he is doing, I cannot say, not having heard from him since a long time. The youngest of that family, *Charles*, aged over 50, is here in Murray Bay, Clerk of the Court and Registrar.

"Now, in a general point of view, the remaining sons and daughters of my father are, without exception, in very limited circumstances, which decidedly would have been far better if our father, notwithstanding his remarkable genius and long service as a Military Surveyor and Draftsman, had not died so poor.

"If what I communicate to you can be of some service, you are welcome to make use of this scrawl as you may think fit."

Thanking you for the kind attention with which this imperfect sketch has been listened to, I have only to say, further, that, through correspondents in England, more ample particulars concerning the model are at this time being procured.

APPENDIX.

APPENDIX

LITERARY AND HISTORICAL SOCIETY OF QUEBEC.

REPORT OF THE COUNCIL,

FOR THE

YEAR ENDING DECEMBER 31ST, 1872.

THE Report of the Council of the progress of the Society during the past year must be virtually a stereotype of those lately preceding—a report of uninterrupted and increasing prosperity. The Stated Meetings were regular and well attended, and have furnished five valuable papers to the "Transactions."

In their last year's Report, the Council stated the completion and publication of the long-contemplated Catalogue of the Library. From causes most unexpected, chiefly connected with the ill-health of the Librarian, Mr. Faucher, which prevented him from attending to his duties, and subsequently led to his resignation of office, the hopes of the Council were not realized; but the President, who undertook, at the request of the Council, to act as Librarian, reports that he had completed the index and placed it in the hands of the printer,—that a few pages of it had been printed, and that there was every reason to believe the printing would be completed in a few weeks.

Owing to an unfortunate misunderstanding as to the authorship of an important document which the Society had proposed to publish, and which has not yet been settled, the Historical-Document Committee has not this year added to the list of the historical publications; but the Council takes this opportunity of stating that neither within the past two years nor at any other period of which it is aware, has any document been printed unless in accordance with the regulations, and which has not been creditable to the Council and the Society. Large and valuable additions, both by purchase and donation, have been made to the Library; and while the Council has

attended to the maintenance of the chief object of the Society, it has felt justified in introducing such works as the Waverley Novels, which may justly be viewed as British classics.

The Museum has been enriched by several valuable donations, forming the foundation of an interesting collection in connection with early Indian affairs.

The ordinary dull season of the summer was this year enlivened by the unexpected visit to Quebec of the Governor-General, Lord Dufferin. The Council availed itself of the opportunity to present him with an address, which was most courteously received and replied to. Encouraged by the reply, and knowing his lordship's high taste in literature, the Council took the liberty of inviting him to address the Society, as had been the practice of its first patron, Lord Dalhousie. His Excellency thought proper to decline, but in such terms as to lead the Society to hope that, knowing the earnest wish of the Society, he may at some future period gratify its hopes.

The Council has not lost its interest in the establishment of a *Public Record Office*, and, in order to further this object, requested the President to permit the publication of a paper which he had prepared, and which, in compliance with that request, has been published in the "Transactions." The Council is not aware of any action having as yet been taken by the Dominion Government.

After striking from the list the names of certain persons who had resigned, and those who, from non-compliance with the regulations, have ceased to be members of the Society, there still remain 256 in full privilege, and entitled to vote at this day's election.

As will be seen by the Treasurer's account, the revenue for the past year amounted to $2,450.16, and the expenditure to $1,695.05, leaving a balance to credit of $755.

Mr. George Mathison, who for several years past had so efficiently discharged the several duties entrusted to him, having been compelled, much to the regret of the Society, to resign his office, the Society had the good fortune to secure the services of Mr. Judd, who, by his careful attention and obliging disposition, has proved no unworthy successor to Mr. Mathison.

The Council, with regret, record the deaths, during the past year, of the Rev. Mr. Plees, Mr. Duncan Patton, Mr. Noel Hill Bowen, and Dr. George Goldstone, who, though not taking any prominent part in its affairs, will yet be much missed by the Society.

The Council must point out to the Society and their successors in office that the evils adverted to by the Acting Librarian, in his last year's report, as to the improper detention of books in defiance of the regulations, have only been remedied to a limited extent, and require some more summary and efficient mode of reaching the offenders than that at present existing.

In conclusion, the Council reports that the good understanding between Morrin College and the Society continues unimpaired—the Council believes to their mutual advantage.

W. J. ANDERSON,

Quebec, 8th January, 1873. *President.*

Literary and Historical Society of Quebec.

REPORT OF THE CURATOR OF THE MUSEUM,

FOR THE

YEAR ENDING DECEMBER 31ST, 1872.

DURING the past year, comparatively few additions have been made to the collection of animals and birds composing the Museum of the Society.

The experience of the past having shewn the advantage of possessing duplicates of bird-skins for purposes of exchange, arrangements have been made with the taxidermist of the Laval University to prepare for the Society such specimens as might be sent to him. A New-York naturalist, visiting Quebec during the summer, obtained from our Museum some few specimens, for which our Society were to receive, in exchange, European birds: they have not, however, yet arrived.

Efforts ought to be made during the ensuing year to add to the department of Oology and Entomology; and also to procure, so soon as accommodation will permit, the large denizens of our forests. This, again, forces on our attention the insufficiency of space to store such large specimens as moose, caribou, deer, bears, &c. By the addition of foreign woods, contributed by Dr. H. H. Miles, one of our Associate-Members, this interesting and useful branch is beginning to assume considerable dimensions. The undersigned cannot too strongly urge on the Society the expediency of completing our collection of woods of commerce, on a scale similar in magnitude to that which attracts so much attention in the Laval University, so as to exhibit each species in the bark, rough, polished, and veneered.

Our collection of medals is rapidly increasing, by gift as well as by purchase.

The undersigned draws attention to the geological and mineralogical portion of the Museum. The wealth of our forests—its woods—is not yet suitably displayed; nor is our mineral wealth.

In concluding, the undersigned has pleasure in noticing the cordial co-operation of the new custodian, Mr. Judd, in carrying out the arrangements which, as Curator, the undersigned thought proper to inaugurate.

J. M. LEMOINE,
Curator of Museum.

Quebec, 10th January, 1873.

DONATIONS TO THE MUSEUM—1871-72.

From Alfred Sandham, Esquire, Montreal, through J. M. LeMoine, Esquire:
1. Bronze Medal—Kebeca Liberata, 1690.
2. " " Frs. Chs. de Lévis, Duc de D'Ampville, 1646.
3. " " Montreal Y. M. C. Association.

From M. Lee, Quebec:—A Button of Quebec Militia, 1775.

From Col. Strange:—A Tusk of the African Boar.

From Jos. Jones Atcheson, Esq., *Baie des Chaleurs*, through J. M. LeMoine, Esq.:—Petrefactions from *Baie des Chaleurs*.

From Maxime Dumont, through Dr. W. J. Anderson:—An Indian Arrow-Head.

From David Craig, St. Foy:—A Blue-Jay's Nest.

From Master Lockwood:—A piece of Ore; one 10-centime, French Republic, 1871.

From Dr. W. J. Anderson:—A Lake Superior Calumet.

From David Craig, St. Foy:—An old Bayonet.

By Dr. W. J. Anderson, from Dr. Johnstone, Pictou:—Dress of Aneiteum Islander—bag, sling, necklace, quiver, poisoned arrows, javelins.

Literary and Historical Society of Quebec.

Abstract of the Treasurer's Account for 1872.

Dr.

1872.		
Jany. 1.—To Balance:		
Historical Document Fund	$130 42	
Life-Members' Fund	54 65	
General Fund	368 89	
		$553 96
To Government Grant		750 00
" Interest on Deposits		37 19
" Received for Sale of "Transactions"		9 00
" Received for Subscriptions from Members		1,100 01
		$2,450 16

Cr.

1872.		
By Paid Rent	$200 00	
" " Insurance	52 75	
" " Salaries	226 62	
" " Gas and Fuel	156 57	
" " Books, Periodicals, Printing, and Advertising	801 35	
" " Museum	80 00	
" " Commission on Collections	58 01	
" " Incidental Expenses	119 75	
		$1,696 05
1873.		
Jany. 1.—By Balance:		
Historical Document Fund	$139 42	
Life-Members' Fund	54 65	
General Fund	561 04	
		755 11
		$2,450 16

Quebec, January 1st, 1873.

(Signed,) WM. HOSSACK, *Treasurer.*

Literary and Historical Society of Quebec.

DONATIONS TO THE LIBRARY, FOR 1872.

	Vols.
By L'Abbé R. Casgrain, A.M. :—Le Journal des Jésuites	1
By the Massachusetts Historical Society :—Historical Collections, vols. 1, 9, 10	3
By ditto :—Proceedings of the Society for 1869-1870	1
By L. Bertolotto :—The "Scientific American" for 1871	1
By Capt. Faucher de St. Maurice :—Series of Jacotot's Works	8
By ditto :—Statuts de La Province de Québec, 1871	1
By Dr. Bernard Gilpin :—Nova Scotia Institute of Natural Science	1
By the Provincial Government :—Statutes of Quebec, English and French.	2
By C. Mathison :—Fyles of "Montreal Witness"	4
By Mr. Bell :—Science of the Weather	1
By the New York State Library :—Manual for the Legislature of the State of New York	1
By ditto :—New York State Library Index	1
By the Dominion Government :—Journals of the House of Commons	2
By ditto :—Sessional Papers for 1872	4
By ditto :—Statuts du Canada, 1871-72	2
By Dr. Anderson :—The Tourist's Guide	1
By J. M. LeMoine :—L'Album du Tourist	1
Through the Smithsonian Institute :—Proceedings of the Royal Society of Edinburgh for 1872	1
Through ditto :—Proceedings of the Philosophical Society of Glasgow for 1872	1
Through ditto :—Proceedings of the Essex Institute	7

Through Captain Faucher de St. Maurice the following works were also received :

By M. Antoine d'Abbadie, Membre de l'Institut de France, Corresponding Member of the Society :

Instructions pour les Voyages de l'Exploration	1
L'Arabie	1
Droit Bilen	1
L'Abyssinie et le Roi Théodore	1
Monnaies des Rois d'Ethiopie	1
Sur le Tonnerre en Ethiopie	1
Catalogue des Manuscrits Ethiopiens	1

By M. Edwin Tross, of Paris, Corresponding Member of the Society :

Carta de Cristobal Colon, (tirage limité)	1
Biographie de Colomb, (tiré à très peu d'exemplaires)	1
Bibliotheca Americana Vetustissionabert. (tirage limité)	1
Bibliographie et Cartographie de la Nouvelle France, (tirage limité)	1
By Faucher de St. Maurice :—Biographie de l'Abbé Laverdière	1

WM. JUDD, Assistant Librarian.

Literary and Historical Society of Quebec.

LIST OF AMERICAN EGGS IN THE MUSEUM.

Goshawk	*14
Cooper's Hawk	15
Red-shouldered Marsh Hawk	25
Osprey or Fish Hawk	44
Short-eared Owl	52
Hawk Owl	62
Black-billed Cuckoo	70
Belted King-Fisher	117
Pewee Flycatcher	135
Traill's Flycatcher	140
Green-crested Flycatcher	143
Hermit Thrush	149
Wilson's Thrush	151
Golden-crowned Thrush	186
Yellow Warbler	203
Redstart	217
Barn Swallow	225
White billed Swallow	227
Purple Martin	231
Red eyed Flycatcher	240
Cat Bird	254
Long-billed Marsh Wren	268
Red billed Nuthatch	279
American Goldfinch	313
Snow Bunting	325
Bay-winged Bunting	337
White crowned Sparrow	345
White-throated Sparrow	349
Red winged Starling	351
Tree Sparrow	357
Field Sparrow	358
Chipping Sparrow	359

* NOTE.—The numbers refer to *Baird's Catalogue* for 1858.

Song Sparrow..... 363
Fox-colored Sparrow..... 374
Indigo Bird..... 387
Cow Bunting..... 400
Meadow Lark..... 406
Crow Blackbird..... 421
American Raven..... 423
Magpie..... 432
Carolina Dove..... 451
Spruce Partridge..... 460
Prairie Hen..... 464
Ruffed Grouse..... 465
Quail..... 471
Snowy Heron..... 485
Killdeer Plover..... 504
Wilson's Plover..... 506
Semi palmated Plover..... 507
Piping Plover..... 508
Red-necked Phalarope..... 521
Willet..... 537
Golden Plover.....
Clapper Rail..... 553
Canada Goose..... 567
Mallard..... 576
Sprig-tail—Pin-tail..... 578
Gadwall..... 584
Harliquin Duck..... 596
Sheldrake..... 611
Red-breasted Merganser..... 612
Marsh Tern..... 681
Sooty Tern..... 688
Arctic Tern..... 690
Foster's Tern..... 691
Least Tern..... 694
Noddy Tern..... 696
Red-necked Diver.....
Razor-billed Auk..... 711
Puffin..... 714
Murre..... 726
Brunswick's Guillemot..... 730
Com. Guillemot—*Var*.....

The following Eggs of American Birds were added in October, 1873, by purchase from A. Lechevalier, of Montreal:

Pigeon Hawk	7
Sparrow Hawk	13
Sharp-shinned Hawk	17
Barn Owl	47
Long-eared Owl	51
Short-eared Owl	52
American Cuckoo	69
Hairy Woodpecker	74
Lewis's Woodpecker	96
Golden-winged Woodpecker	97
Whip-poor-Will	112
Night Hawk	114
Belted King-Fisher	117
King Bird	124
Great Crested Flycatcher	130
Pewee	135
Least Flycatcher	142
Wood Thrush	148
Wilson's Thrush	151
Robin—Migratory Thrush	155
Stone-Chat	157
Blue Bird	158
Scarlet Tanager	220
Louisiana Tanager	223
Cliff Swallow	226
Bank Swallow	229
Cedar Bird	233
White rumped Shrike	238
Warbling Flycatcher	245
White-eyed Vireo	248
Yellow-throated Flycatcher	252
Mocking Bird	253
Brown Thrush	261
House Wren	270
White-billed Nuthatch	277
Purple Finch	305
Savannah Sparrow	332
Yellow winged Sparrow	338
Sharp-tailed Finch	341
Sea-side Finch	342

Lark Finch..... 344
Black Snow Bird..... 354
Swamp Sparrow..... 369
Black-throated Bunting..... 378
Rose-breasted Grosbeak..... 380
Louisiana Cardinal..... 390
Ground Robin—Towhee..... 391
Bob-o-link..... 399
Red-winged Blackbird..... 401
Yellow-headed Blackbird..... 404
Orchard Oriole..... 414
Baltimore Oriole..... 415
Boat-tailed Grakle..... 420
American Raven..... 423
Magpie..... 432
Yellow-billed Magpie..... 433
Blue Jay..... 434
Wild Pigeon..... 448
Ground Dove..... 453
Sharp-tailed Grouse..... 463
American or White Crane..... 478
Sand-hill Crane..... 479
Reddish Egret..... 483
Louisiana Heron..... 484
California Egret..... 486
Great Blue Heron..... 487
Least Bittern..... 491
Bittern—Stake Driver..... 492
Green Heron..... 493
Night Heron..... 495
Oyster-catcher..... 512
American Avoset..... 517
Black-necked Stilt..... 518
English Snipe..... 523
Spotted Sandpiper..... 543
Field Plover..... 545
Marsh Hen..... 552
Virginia Rail..... 554
Common Coot..... 559
Florida Gallinule..... 560
Black Duck..... 577
Blue-winged Teal..... 581
Shoveller..... 583

Wood Duck..... 587
Greater Blackhead..... 588
South Southerly..... 597
Eider Duck..... 606
King Duck..... 608
Red-breasted Merganser..... 612
Hooded Merganser..... 613
Brown Pelican..... 616
Solan Goose—Gannet..... 619
Common Cormorant..... 620
Florida Cormorant..... 624
Leach's Petrel..... 642
Great Black-backed Gull..... 660
Herring Gull..... 661
Western Gull..... 662
Ring-billed Gull..... 664
Laughing Gull..... 667
Caspian Tern..... 682
Royal Tern..... 683
Cabot's Tern..... 685
Roseate Tern..... 692
Noddy Tern..... 696
Black Skimmer..... 697
Carolina Grebe..... 709
Arctic Puffin..... 751
Black Guillemot..... 726
Foolish Guillemot..... 729
Murre..... 730

Also, a few Eggs of European Birds, Corvus Glandivora; Corvus Corone; Perdrix Coturnix, etc.

J. M. LeMOINE, *Curator.*

Literary and Historical Society of Quebec.

LIST OF MEMBERS, 1873.

LIFE-MEMBER:—THOMAS GLOVER, ESQUIRE.

Associate Members.

Ahern, M.J., M.D.
Andrews, F. H.
Ashe, E. D., Comdr., F.R.S.
Adam, J.
Anderson, W.

Baby, M. W.
Baillairgé, Chas.
Baillairgé, L. J.
Becket, P.
Belleau, J. F.
Bennett, Benson.
Benson, W. P.
Bertolotto, L.
Billingsley, F.
Blanchet, Hon. J. G., M.P.
Blanchet, H.
Boswell, J. K.
Boswell, W., M.D.
Bossé, J. G.
Bouchette, Jos.
Bowles, J.
Bradley, R. J.
Breakey, G.
Browne, W. P.
Bruce, R.
Budden, J. S.
Burroughs, J. H. R.
Breakey, W.
Burns, J. G.
Burstall, J.

Campbell, Arch.
Campbell, G.
Campbell, W.D.
Casgrain, P. B.
Casgrain, R., l'Abbé, A. M.
Cartwright, J.
Cassels, Robt.
Caron, A. P.
Charlebois, J. A.
Chauveau, Hon. P. J. O., M.P.
Chinic, Hon. Eugène.
Clark, Rev. W. B.
Colston, J. G., B.A., L.L.M.
Cook, W.
Clint, W.
Crawford, J.
Carrel, J.
Chapman, A. G.
Colfer, G. W.
Chouinard, H. J.
Carter, W. C., Capt.

Dawson, J. T.
Davies, W. A.
Dechêne, M.
Delagrave, C.
Delaney, P.
Donaldson, L.
Dinning, H.
Douglas, Jas., Jr.
Douglas, Dr. James.
Doucet, P. A.

Dorion, L. E.
Dunbar, J.
Drum, S. W.
Duval, G.
Davidson, H.
Duchesnay, E. J.
Duggan, W. E.
Duggan, E. J.

Epps, B. R.
Elliott, Rev. J.
Elliott, Joseph.

Fabre, Hector.
Falkenberg, F. A.
Falkenberg, F.
Faucher de St. Maurice, N. H. E.
Foote, J. J.
Fraser, A.
Fraser, A.
Fraser, Hon. J.
Fry, H.
Fry, J. S.
Foote, S. B.
Fuchs, C. H. A.
Fothergill, Rev. M. M.

Geggie, D. H.
Geggie, J.
Gibb, Jas.
Gibsone, J. F.
Gibsone, W. C.
Gilmour, Jno.
Garneau, P.
Glass, H.
Glass, Jno.
Globensky, B.
Goodwin, J. W.
Grant, T. H.
Gregory, J. U.

Hall, G. B.
Hall, G.
Hemming, H.

Heap, R.
Henry, J. W.
Hart, Geo.
Holt, C. G.
Horan, J.
Hossack, J.
Hossack, W.
Hamilton, R.
Hamilton, Rev. Chas.
Hossack, J. F.
Housman, Rev. G. V.
Hunt, W.
Hunter, T.
Holwell, W. A.
Huot, E.

Irvine, Hon. Geo., M.P.

Jackson, A. H.
Johnsen, C. J.
Johnstone, P.
Joly, H. G., M. P.
Joseph, A.
Jeffery, W. H.
Jones, E.

Lampson, F.
Langlois, Jean, M.P.
Langlois, C. B.
Lamontagne, E.
Laird, J. U.
Ledroit, T.
LeMoine, Gasp.
LeMoine, J. M.
Lesage, S.
LeSueur, P.
Lindsay, C.
Languedoc, W. C.
Laurie, J.
Lindsay, C. P.

MacEwen, P.
Mackedie, D. C.
Maclaren, W. M.

Macleod, D. R.
Marsden, W., M.A., M.D.
Maxham, A. J.
McCord, T, Hon. Justice.
McCallum, W. C.
McGreevy, Hon. T., M.P.
McHugh, L. H.
McKay, J.
McLeod, R.
McNaughton, Jno.
McNaughton, P.
Miles, H. H., LL.D.
Montizambert, C. N.
Montpetit, A. N.
Moodie, W.
Morgan, F.
Middleton, R.
Mountain, M. G.
Murphy, O.
Motz, J.
Mitchell, Rev. R.
McLimont, R.
Montizambert, F., M.D.
Milne, T.
Morrin, L. A.
Montizambert, E. L.

Neilson, Jno.
Neilson, R., M.D., Surgeon, Dominion Artillery.
Nesbit, E.

Oliver, J. M.
O'Meara, D. D.
O'Neil, J.
Oliver, J. E.

Patton, W.
Paradis, O. E.
Parkin, E. B.
Peebles, P.
Peters, H. J.
Peters, S.
Pope, E.
Pope, A.
Poston, C.
Poston, T. I.
Poston, W.
Powis, Rev. H. D.
Powis, H. W.
Price, E. J.
Pemberton, G.
Patton, J.
Provost, O.
Parker, A.

Quebec, J. W., Lord Bishop.

Rattray, D.
Rawson, Rev. C. W.
Renaud, J. B.
Renfrew, G. R.
Rhodes, Col. W.
Robertson, A.
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